B 80 W
Service Manual

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1 Preface

Good service work requires extensive and practice-oriented training as well as well-structured training materials.
Hence we offer regular basic and advanced training programmes covering the entire product range for all service engineers.
In addition to this, we also prepare service manuals for important appliances - these can be initially used as instruction guides and later on as reference guides.
Apart from this, we also regular information about product enhancements and their servicing.

If you should require supplements, have corrections or questions regarding this document, please address these citing the following subject to:
international-service@de.kaercher.com

Subject: ***Fall 114253***

The responsible product specialist will take care of your issue.

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2 Safety instructions

2.1 Hazard levels

⚠ Danger
Immediate danger that can cause severe injury or even death.
⚠ Warning
Possible hazardous situation that could lead to severe injury or even death.
Caution
Possible hazardous situation that could lead to mild injury to persons or damage to property.

3 Technical Features

The scrubber vacuum is used for wet cleaning or polishing of level floors.
Working width
- BR version: 650 mm +750 mm
- BD version: 650 mm +750 mm

Filling quantities
- Fresh water tank: 80 l
- Waste water reservoir: 80 l

Drive
The device is self-moving; the drive motor is feed by four batteries.
The drive motor can pick up a max. of 38 A of current for a duration of 2 minutes and can then handle short inclines.
brake
The appliance is equipped with an emergency brake that is operated with a foot pedal.
Device variants
The scrubber vacuum cleaner is offered in the following model:
- 24 V DC

Key
KIK System (KÄRCHER INTELLIGENT KEY)
Standby
The control will go to standby after a predefined time period in idle.
- After 30 minutes if no controls are actuated.
- After 10 minutes if RFID is not activated.

The control needs to be switched off and back on again using the programme selector switch.
Operating hour counter
The operating hours are saved in the control panel board and in the control electronics. After a board is replaced, the operating hours are taken over by the other board.
Maintenance interval display
Maintenance intervals are displayed for the operator at defined times to achieve the best cleaning results.
Display after 20 hours:
- Clean the vacuum bar!

Display after 100 hours:
- Check the wear on the brush!
- Check the suction lip!
- Clean turbine sieve!
- Clean the fresh water filter!

after 200 hours:
- Service timer

The display can be reset by pressing the I button.
Chassis
- The chassis is independent of the brush head.
- Innovative control system for even easier operation (KIK-KÄRCHER INTELLIGENT KEY)
- Reduced sound level.
- Colour coding of the control and maintenance elements.

The operating elements for the cleaning process are yellow.

The controls for the maintenance and service are light gray.

Water dosing valve

The water dosing valve is actuated electronically.

Suction turbine

Encapsulated quiet turbine.

Wastewater reservoir

- Wastewater reservoir rinsing system (option)
- Coarse dirt sieve
- Tank closure venting function
- The wastewater reservoir can be pivoted sideways.

Fresh water tank

Auto Fill-In (option)

Floor head quick exchange system

- Simple - no tools required
- The following brush heads are available:

  D 65 + D 75

  R 65 + R 75

  S 65 (Swing) to remove and grind polymer coatings.

Floor head drive

- Both brushes are turning toward each other.
- The floor head is raised and lowered via the lifting motor.

Vacuum bar

- The vacuum bar is raised and lowered via the lifting motor.
- The appliance can be operated with a curved or straight vacuum bar.

Charger

- All battery-powered scrubber vacuums are equipped with a charger with a wide-range voltage power supply (100-240 V 50-60 HZ).
- The charger parameters can be adapted to the integrated battery.

Battery

- The package appliances are also equipped with batteries.
- The appliance can be operated with 170 Ah, 180 Ah and 240 Ah batteries.

Homebase System

- Different options are offered, i.e. to carry a mop, cloths and detergent bottles with you.

3.1 Type plate

The type plate shows whether the appliance was configured or confectioned.

Type plate configured

The appliance was manufactured in the plant according to customer specifications.

The part number is issued automatically during the configuration process.

1 Serial number

2 Part number

The serial number refers to the part number 1.259-010.2.

Type plate confectioned

The appliance consists solely of a rump unit. The appliance can be assembled with the different assemblies on site.

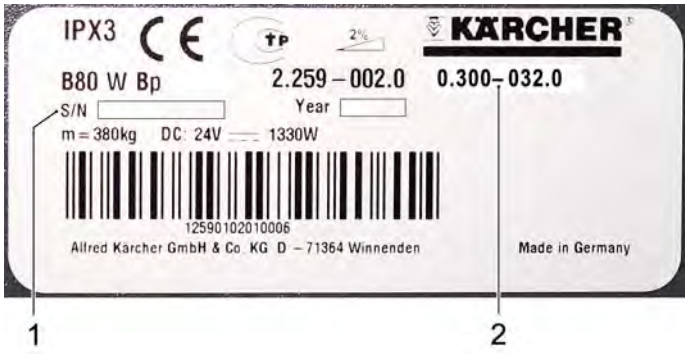
1 Serial number

2 Part number

The serial number refers to the part number of the rump unit 2.259-002.00.

Type plate material model

Complete appliances as requested by the market are preproduced under this part number.



1 Serial number

2 Part number

The serial number refers to the part number 0.300-032.0.

The part number 0.3xx-xxx.x and the serial number S/N are required for technical enquiries.

DISIS

Base appliance 2.xxx-xxx.x must be entered into the search box of the DISIS.

4 Parts of the system

4.1 Front view

1 Basket
2 Cover dirt water reservoir
3 Detergent hose
4 Detergent reservoir (option)
5 Fresh water reservoir filler neck
6 Fresh water tank
7 Unlocking device, left disc brush
8 Brush head (BD model only)
9 Disc brush
10 Scraper roller
11 Unlocking device, right disc brush
12 Drive wheel
13 Steering roller
14 Vacuum bar
15 Dirt water reservoir
16 Lid cap
17 Strip to attach accessories
18 Handle with travel switch

4.2 Rear view

1 Recessed grip
2 Auto Fill-In
3 Fresh water level display
4 Parking brake/ foot brake pedal
5 Star handle screw for adjusting the height of the vacuum bar
6 Star handle screw
7 Deflector
8 Vacuum lip mounting
9 Support roller, vacuum bar
10 Rotary handle to incline the vacuum bar
11 Suction hose
12 Wing screw of suction bar support
13 Suction lips
14 Screw-on lid, fresh water drain with sieve
15 Dirt water drain hose
16 Cable hook, rotating
17 Mains cable of charger
18 Cable hook, rotating
19 Water quantity regulator
20 Program selection switch
21 Drive switch, forward/reverse
22 Rotating button for drive speed
23 Intelligent Key
24 Display
25 Info button

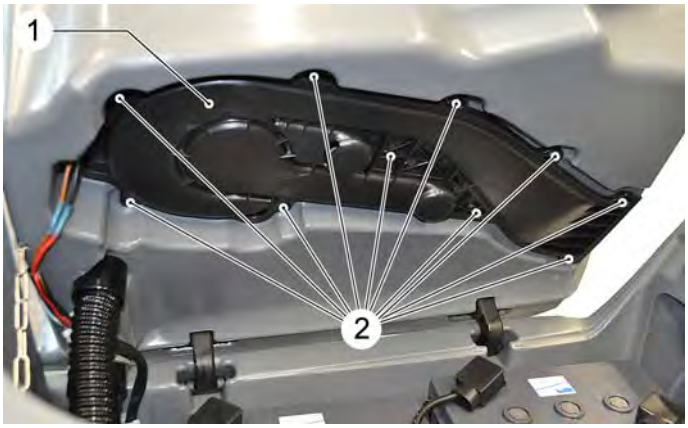
4.3 Inside view

1 Connection cable suction turbine
2 Dirt water reservoir
3 Suction channel cover
4 Batteries
5 Dirt water drain hose
6 Suction hose
7 Coil Chain

Swivel the tank upward

➔ Hold the wastewater reservoir by the handle recess and swivel the reservoir upwards toward the side.

4.3.1 Top of appliance



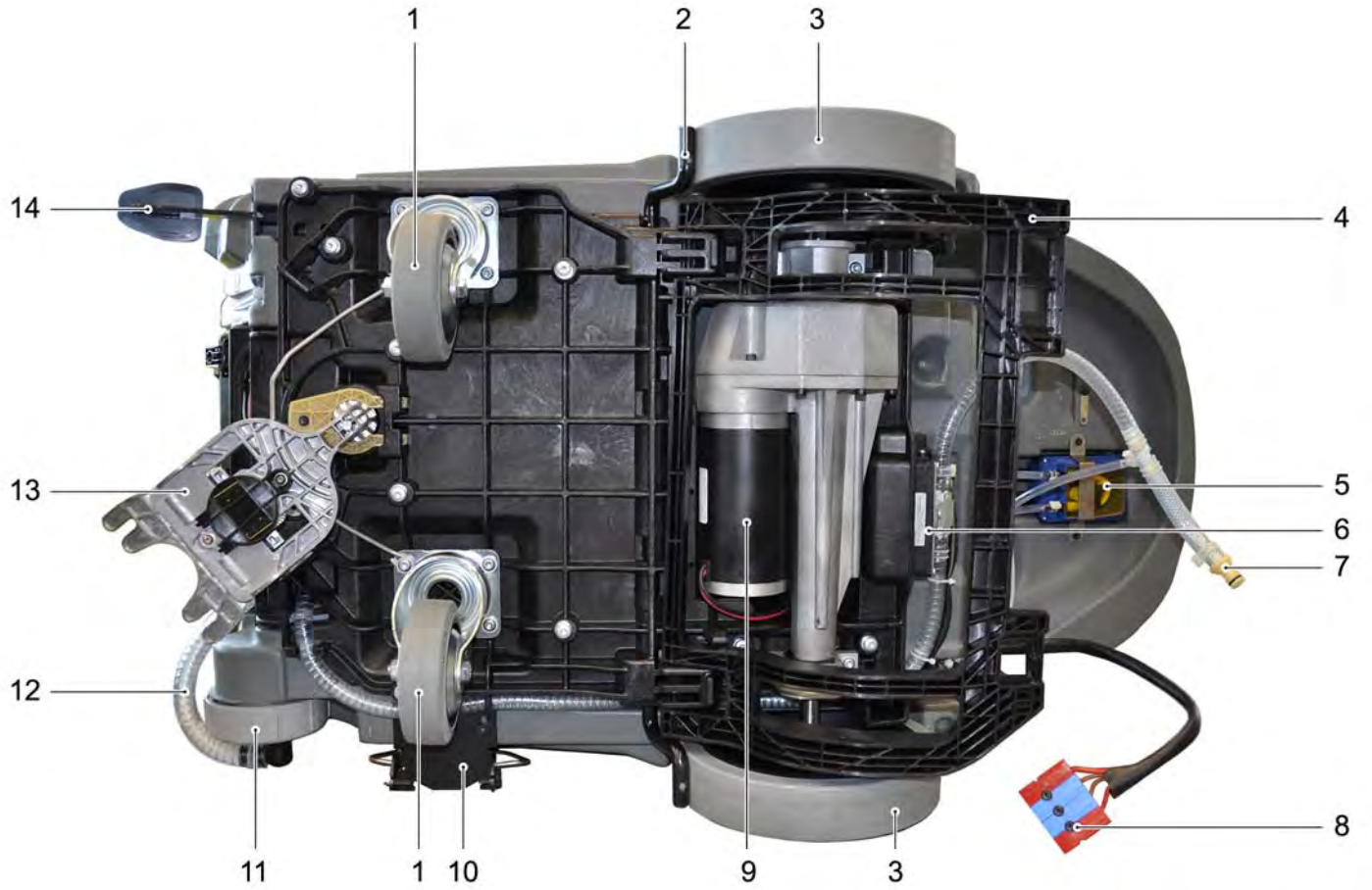
1 Suction channel cover
2 Screws

4.3.2 Wastewater reservoir

1 Wastewater stub
2 Coarse dirt sieve
3 Dirt water reservoir
4 Float of wastewater tank
5 Fluff filter
Suction turbine air channel

1 Seal of cover of wastewater reservoir
2 Nozzles
3 Opening in suction channel, connection for air channel of suction turbine
4 Fluff filter
5 Float
6 Disc
7 Hose ring
8 Protective cover

4.4 Bottom view

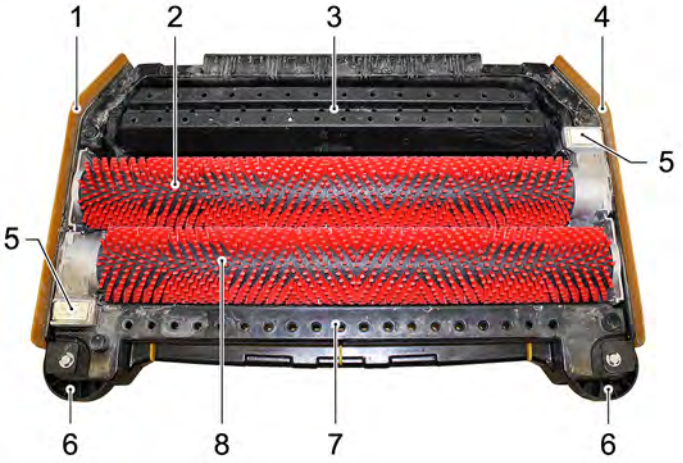


1 Steering roller
2 Brake linkage
3 Drive wheel
4 Push rod, brush head
5 Detergent dosing pump (DOSE)
6 Water dosing valve
7 Quick coupler connection
8 Brush head connection plug
9 Drive motor
10 Mop rest
11 Screw-on lid, fresh water drain with sieve
12 Fresh water hose
13 Vacuum bar suspension
14 Parking brake/ foot brake pedal

4.5 Brush heads

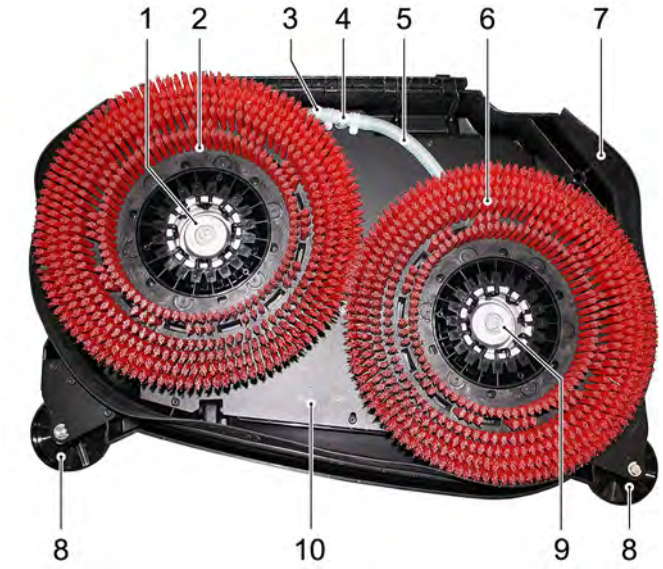
4.5.1 BR cleaning head

1 BR cleaning head "S", with sealing lips
2 BR cleaning head, without sealing lips



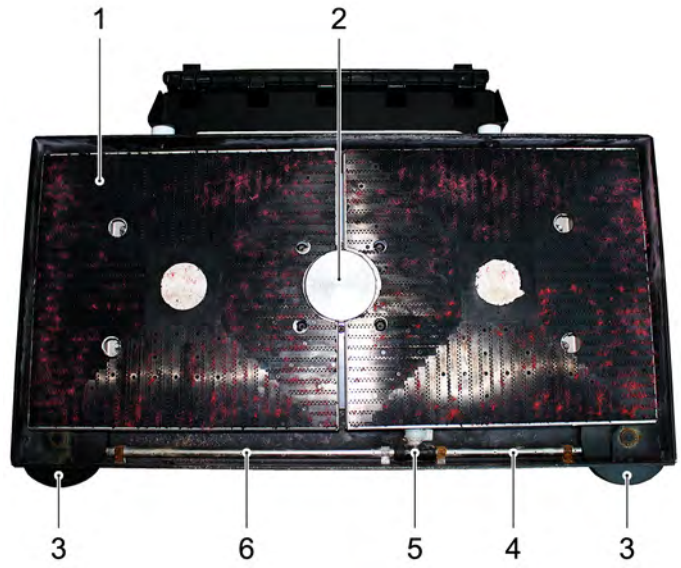
1 Sealing lip, left (S version only)
2 Brush roller, rear
3 Coarse dirt container
4 Sealing lip, right (S version only)
5 Slide shoe
6 Scraper roller
7 Water distribution bar
8 Brush roller, front

4.5.2 BD cleaning head



1 Disc brush pick-up left
2 Disc brush, left
3 Water distribution hose, left
4 T-piece
5 Water distribution hose, right
6 Disc brush, right
7 Seal strip
8 Scraper roller
9 Disc brush pick-up, right
10 Floor plate

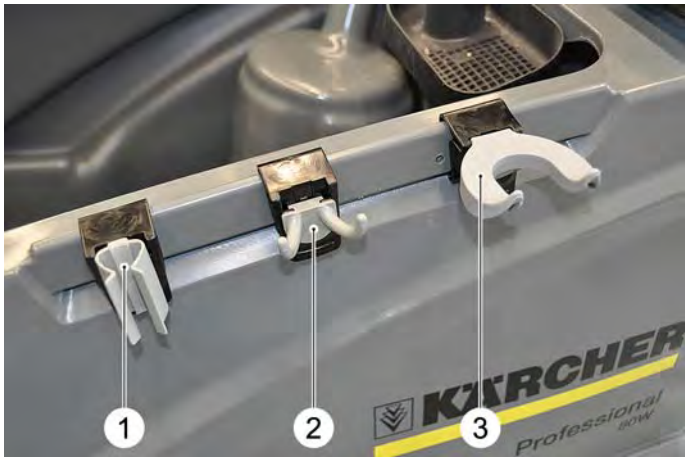
4.5.3 S 65 (Swing)



1 Pick-up, grinding pad
2 Eccentric
3 Scraper roller
4 Water distributor pipe, right
5 T-piece
6 Water distributor pipe, left

4.6 Accessories

1 Basket
To carry detergent bottles and cleaning supplies.

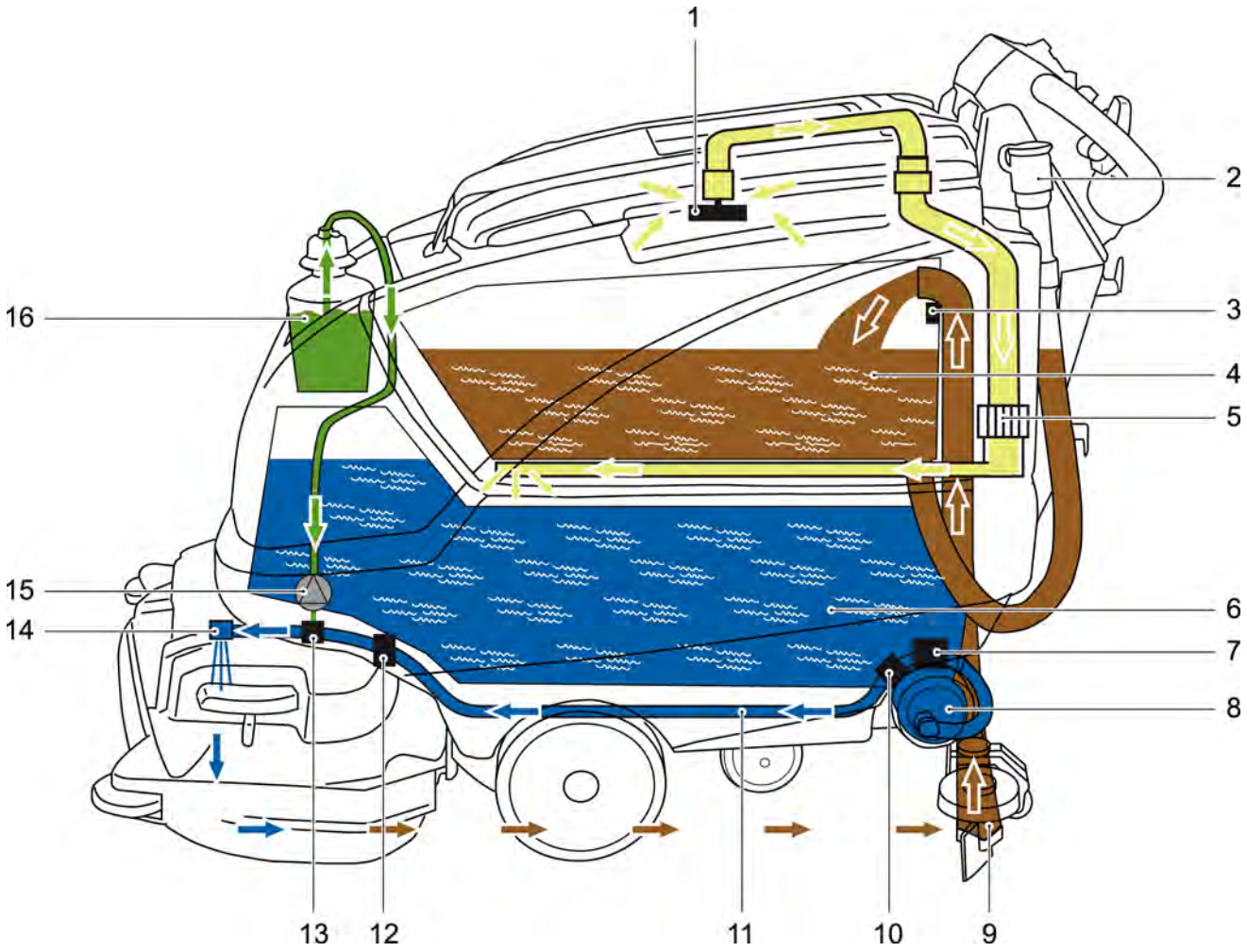


1 Clip
To attach broom and mop.
2 Hook
To hang up cleaning accessories.
3 Hook
To hang up cleaning accessories.

Homebase - application example

5 Function

5.1 Functional diagram



1 Float
2 Dirt water discharge hose
3 Float of wastewater tank
4 Dirt water reservoir
5 Suction turbine
6 Fresh water tank
7 Water pump
8 Screw-on lid, fresh water drain with filter sieve
9 Vacuum bar
10 Flowmeter
11 Fresh water hose
12 Water volume dosing valve
13 Detergent injector
14 Water distribution bar
15 Detergent dosing (DOSE)
16 Cleaning agent container

5.2 Operator console

1 Display
2 Info button
3 Water quantity regulator
4 Sliding handle
5 Drive switch, forward/reverse
6 Program selection switch
7 Rotating button for drive speed
8 Intelligent Key

Program selection switch
The appliance is switched on and off by rotating the programme selector switch and the different cleaning programmes can be selected.
Info button
In connection with the grey and red intelligent keys, the info button can be used to access menus and appliance settings. You can set different adjustments on the appliance, depending on the use and the conditions on site. Depending on the access rights, appliance-specific data can be shown.
Display
The display will show all menus and appliance settings that were retrieved via the info button, as well as the battery status, fault messages and maintenance interval information.
Drive switch
You can use the drive switch to select the driving direction. By pressing your thumb on the top tilting section of the drive switch, you will drive the appliance forward. If you pull on the top tilting section, the appliance will move backwards. The drive speed is regulating by the force of pressure on the switch.
Rotary knob for drive speed
You can use the rotary knob for drive speed, you can steplessy adjust the maximum speed, which the appliance is to drive during its use.
Water quantity regulator
Adjust the detergent flow using the water regulation knob.

Battery balance

The balance indicates mandatory information regarding the existing battery power. The battery indicator shows the available battery capacity, which is calculated from the supplied power of the battery charger to the battery and the power consumed by the battery.
The battery balance is shown as bars and the last 2 minutes in minute steps.

If the battery of the appliance is disconnected and reconnected, the battery indicator shows the battery voltage as a bar graph. This can be read by the dot next to the bar.
This display is less accurate and is calculated from the battery voltage. After the empty battery is completely charged, the battery indicator will display the battery balance once again.

5.2.1 Programme settings

1 **OFF**
Device is switched off
2 **Transport mode**
Driving to the Place of Use.
3 **Eco mode**
Wet clean the floor (with reduced brush speed and water volume) and vacuum up wastewater (with reduced suction und reduced suction force).
4 **Normal mode**
Wet clean the floor and vacuum up dirt water.
5 Increased brush contact pressure
Wet clean the floor (with increased brush contact pressure and max. water volume) and vacuum up wastewater.
6 **Intense mode**
Wet clean the floor (with increased brush contact pressure and max. water volume) and let the detergent soak in.
7 **Vacuum mode**
Suck in the dirt fleet.
8 **Polishing mode**
Polish the floor without the application of liquid and max. brush contact pressure.

5.3 Intelligent Key

User-specific releases are saved in the intelligent key. The appliance can only be put into operation after the intelligent key has been inserted.
There are three different key types with different colours and their corresponding user groups.

Key colour	User group
Yellow	Operator
Grey	Supervisor / Facility Manager (M)
Red	Service technician (S)

5.3.1 Yellow intelligent key

Appliance functions cannot be modified.
The user can work with preset programmes at the start of his day via programme selector switches. No adjustment possibility.

5.3.2 Grey Intelligent Key

The Supervisor/Facility Manager can define access rights/releases of appliance functions for the yellow user key.
The Supervisor/Facility Manager has access to almost all relevant appliance functions, but not to service parameters.

5.3.3 Red intelligent key

The service technician has access to all parameters and appliance functions.
The service technician can also issue rights for the yellow user key.

Note
If two intelligent keys are used at the same time, faults can be caused in the control electronics. Always use the intelligent keys individually.

5.4 Auto Fill-In

1 Water pipes
2 Safety overflow

For the quick filling of the fresh water tank.
If the automatic shut-off does not react, the water will flow out of the safety overflow.

➔ Connect the water hose with the quick coupling.
➔ Open the water tap.
The fill process stops automatically as soon as the tank is full.
➔ Turn off tap.
➔ Pull off the water hose.

Function

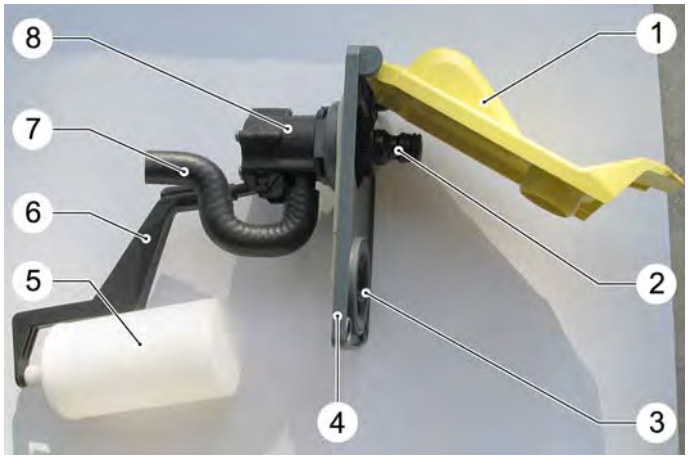
The water will run into the tank via the quick coupling and the water filter through the valve.
Here, the water flows through the small diaphragm bore, pushes the diaphragm back at the same time and opens the valve.
The float is pressed upwards once the fresh water tank is full.
After the seal of the float linkage closes the outlet opening, a stronger water pressure builds up behind the diaphragm and closes the valve.

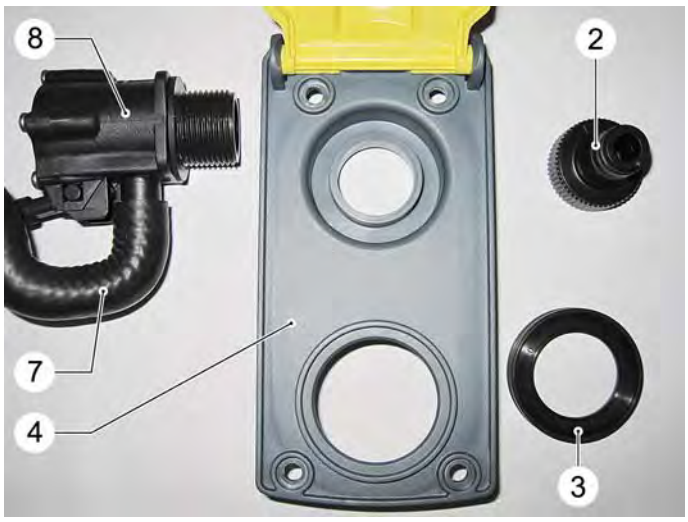
Note

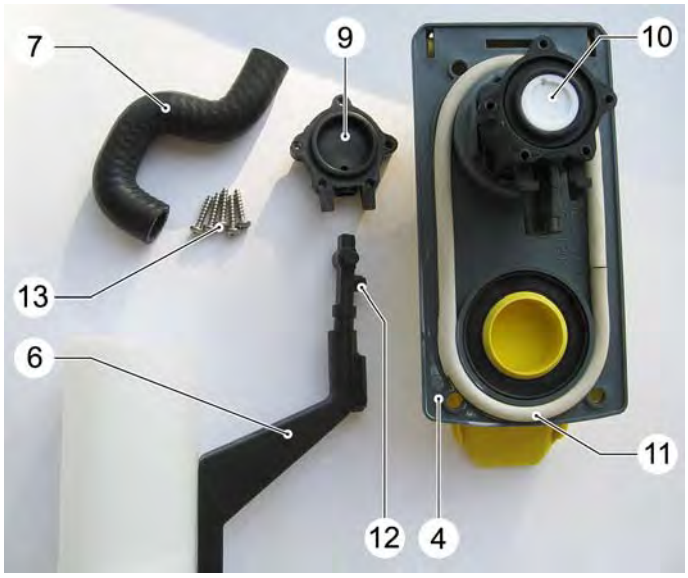
If the form hose is not installed, water will spray out of the safety overflow opening during the tank filling process.

Notes regarding removal

– The water filter cannot be replaced.
– The cover is clamped on and can be pushed out.
– The seal of the safety overflow can be pushed out of the front plate.
– The O-ring seal can be taken out of the front plate.







1 Cover
2 Quick coupling
3 Seal of safety overflow
4 Front plate
5 Float
6 Float linkage
7 Form hose
8 Valve
9 Cover
10 Diaphragm
11 O-Ring
12 Seal of float linkage
13 Screws
14 Water filter

5.5 Fresh water drain

1 Screw-on lid, fresh water drain with filter sieve
2 Fresh water hose

Large fresh water drain for a quick drain of the fresh water tank. If needed, you can use the water hose to rinse the fresh water tank via the large opening.

1 Screw-on lid, fresh water drain with filter sieve
2 Inside of lid with water connection
3 Filter sieve

In order to protect all components from contamination, there is a filter sieve installed between the tank and the screw-on lid.

5.6 Tank lid ventilation system

To ventilate and dry out the wastewater tank.

1 Lid cap
2 Intake

➔ To ventilate the tank, press the lid lock toward the inside and insert it into the pick-up.

5.7 Tank rinse system (option)

1 Hose connection
2 Protective cover
3 Hose ring
4 Nozzles

Note

The protective cap prevents wastewater from entering the tank rinse system.

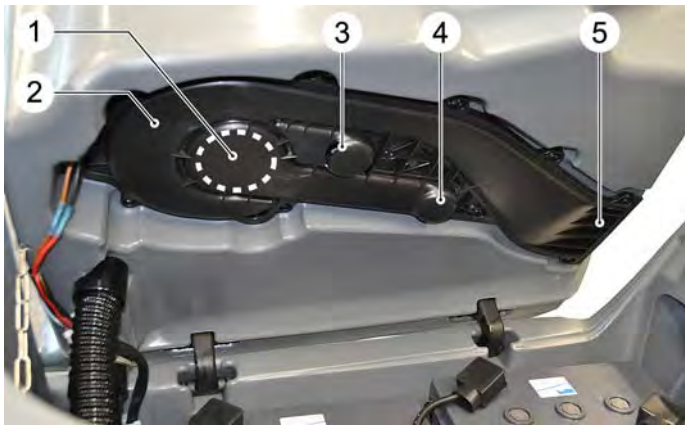
If the protective cap is not attached to the hose coupling, it will function as a spacer between the tank and the lid during tank rinsing.

1 Protective cover
2 Water pipes

The The wastewater tank is cleaned after the cleaning process via the nozzle system.

➔ Remove the protective cap.
➔ Connect the water hose via the quick coupling.
➔ Place the wastewater drain hose over a suitable drain and open the locking cap.
➔ Open the water tap and rinse the tank.

5.8 Suction turbine

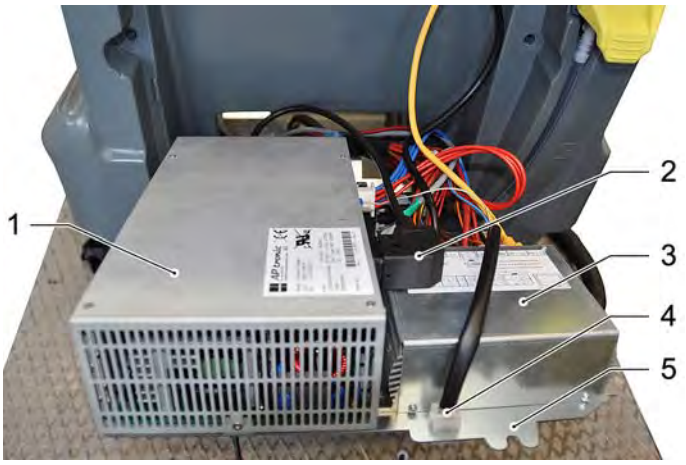


1 Suction turbine
2 Suction channel cover
3 Cooling air outlet, suction turbine motor
4 Cooling air inlet, suction turbine motor
5 Wastewater tank exhaust air outlet

The suction turbine is located beneath the suction channel cover.

The suction turbine has a trailing time of 5 seconds after the programme selector switch has been set to a programme without suctioning.

5.9 Charger control electronics



1 Charger
2 Connecting cable for charger
3 Control electronics
4 Connection cable lifting motor vacuum bar
5 Support plate, control electronics

The charger is controlled by the control electronics. The necessary charger parameters for the built-in battery are selected in the control electronics.

5.10 Acuation of detergent dosing

1 Detergent dosing pump (DOSE)

The detergent dosing is actuated from 0.....3% in 0.5% increments as per the set up dosing.
The actuation is running if:

- the brush is running,
- there is water flow,
- the dosing is set up.

6 Basic settings and service procedures

⚠ Danger

Risk of injury! Before working on the appliance, remove the Intelligent Key and the mains plug of the charger.

Drain and dispose of the dirt water and the residual fresh water.

⚠ Danger

Switch the appliance off and unplug the mains plug prior to performing any service work.

With battery-operated appliances, disconnect the battery at the negative terminal.

6.1 Replace the fuse

1 Batteries
2 Nut with flange
3 Fuse F1 (125 A)
4 Positive cable

➔ Hold the wastewater reservoir by the handle recess and swivel the reservoir upwards toward the side.

Note

Press the positive cable against the nut with flange while unscrewing the nut. The flange must not be damaged, as this would render the fuse useless.

➔ Unscrew the nut.

➔ Remove the positive cable.

➔ Replace the fuse.

6.2 Operator console

6.2.1 Replace the programme selector switch

1 Operator console
2 Screws, operator console

➔ Pull off the rotary knob of the programme selector switch.

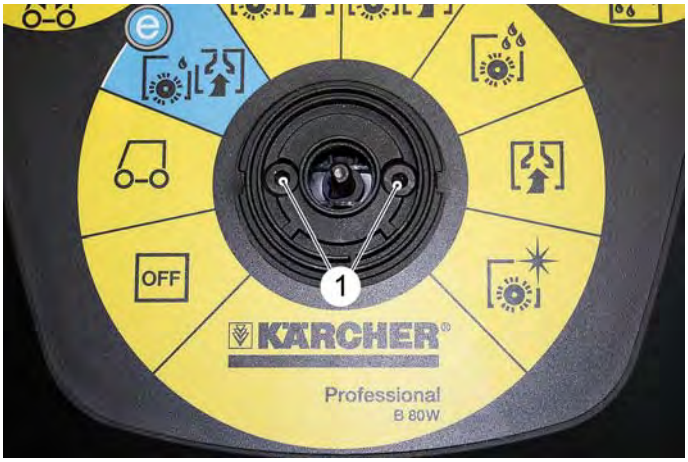
➔ Unscrew the screws.

➔ Unscrew the screws on the left and right side of the control panel.

➔ Tilt the operating panel forward.

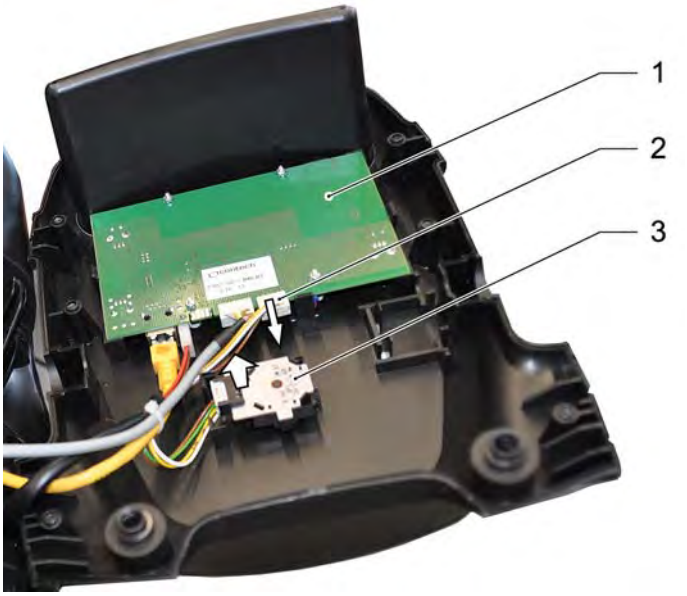
1 Screws, casing halves of the control panel

➔ Loosen the screws and separate the casing halves.



1 Screws, programme selector switch

➔ Unscrew the screws.



1 Operating panel board
2 Plug, programme selector switch
3 Program selection switch

➔ Pull out the plug on the printed circuit board on the operating panel and remove the programme selector switch.

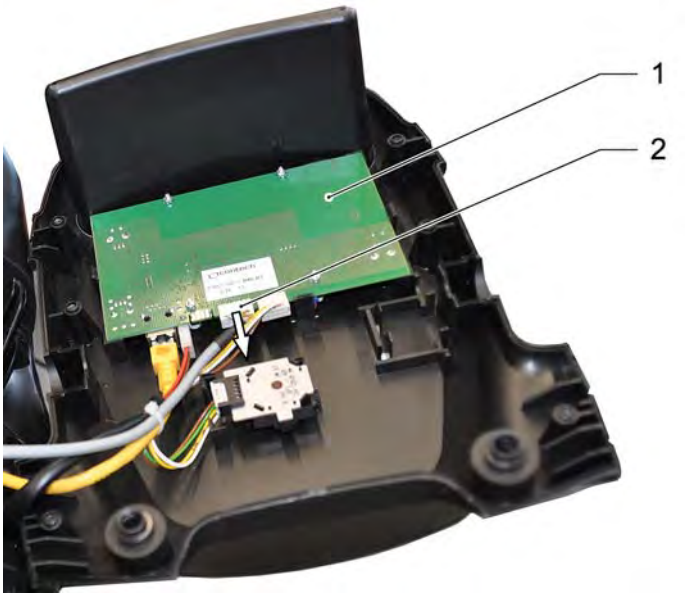
6.2.2 Check the programme selector switch

1 Program selection switch
2 Resistance measuring gauge
3 Plug

➔ Connect the resistance measurement device to the plug connections of the respective coloured cables.
See table below.

Switch setting	Resistance measurement between		Nominal value in Ohm
OFF	white		–
Transport mode	white	yellow	<50
Eco mode	white	yellow green	<50
Normal mode	white	green	<50
Increased brush contact pressure	white	green brown	–
Intense mode	white	yellow green brown	<50
Vacuum mode	white	yellow brown	<50
Polishing mode	white	brown	<50

6.2.3 Check the travel switch.



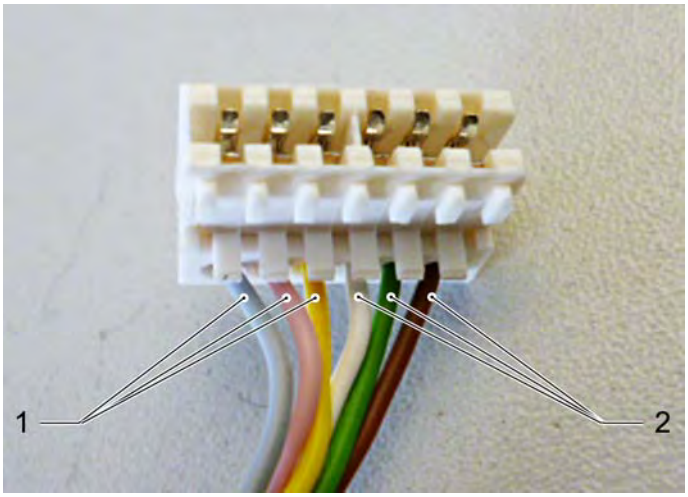
1 Operating panel board
2 Plug, drive switch

Note

The potentiometer is tested in debug mode or with the measuring gauge on the operator panel board.

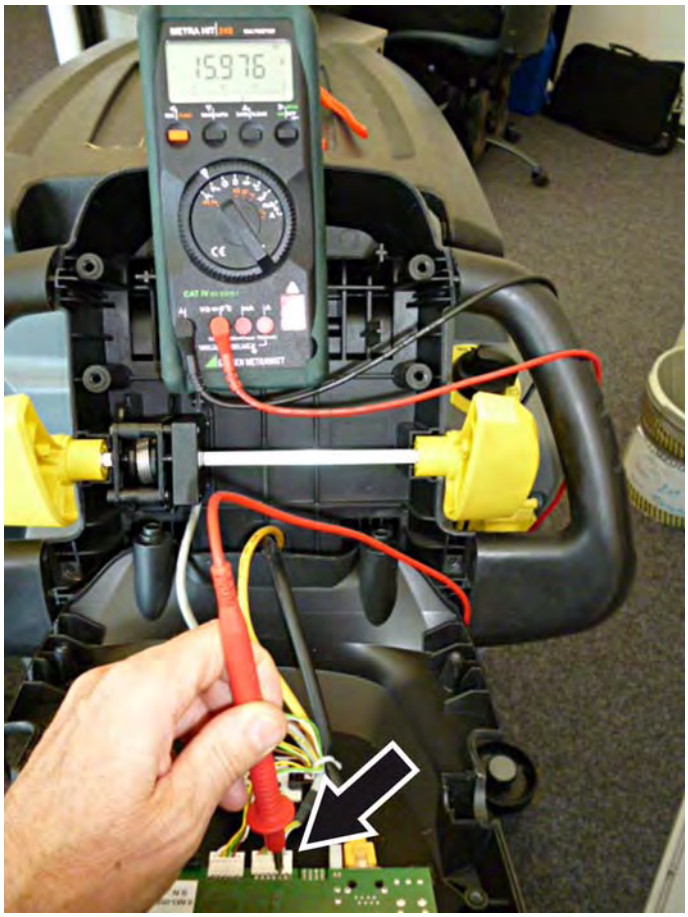
➔ Open the operating panel.

➔ Pull out the plug on the control panel board.

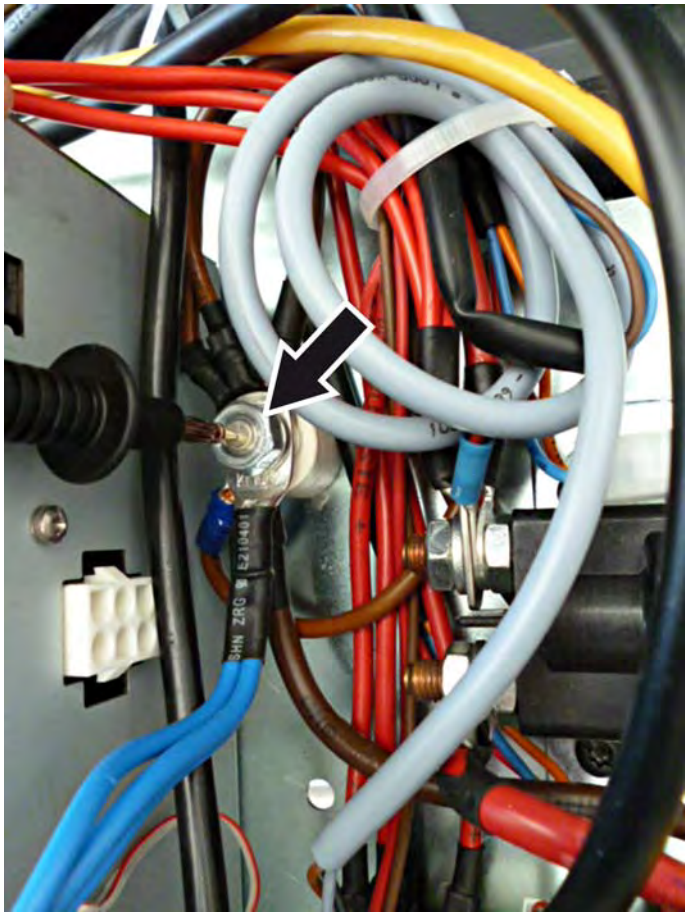


1 Travel direction switch forward/reverse (grey, pink, yellow)
2 Speed (white, green, brown)

Check the travel switch.



Control panel board plug terminal X3



Control electronics negative point

➔ Turn the device on and set it to transport mode.

Measurment between the negative point and ...	Note / switch position	Result in VDC
pink	Unplug the plug for the travel switch from the control panel board and measure on the pink plug terminal X3 of the control panel board.	~ U/batt negative 1 V
pink	Leave the travel switch plug on terminal connector X3 of the control panel board in place.	~ 15 V

Conduct all subsequent measurements with the plug in place.

➔ Plug in the travel switch plug on terminal connector X3 of the control panel board.

Measurment between the negative point and ...	Note / switch position	Result in VDC
grey	Travel regulator 0 position	0 V
grey	Travel regulator forward	~ 15 V
yellow	Travel regulator 0 position	0 V
yellow	Travel regulator reverse	~ 15 V

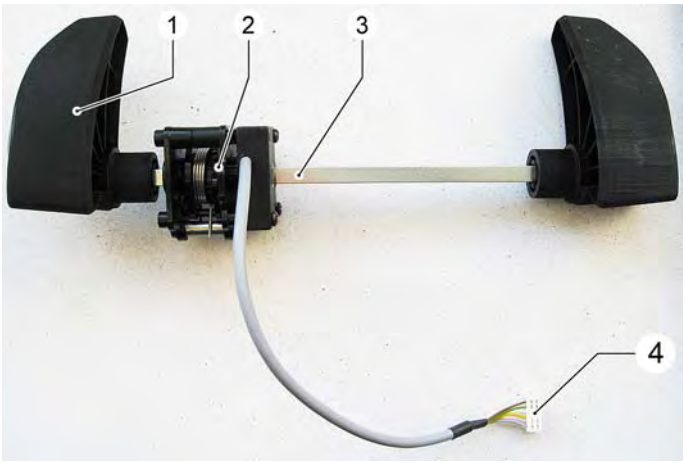
Check the speed potentiometer

Measurment between the negative point and ...	Note / switch position	Result in VDC
white	Travel regulator 0 position	~ 2 V
brown	Travel regulator 0 position	0 V
green	Travel regulator max. forward drive	< 2 V
green	Travel regulator max. reverse drive	< 2 V

6.2.4 Replace the drive switch

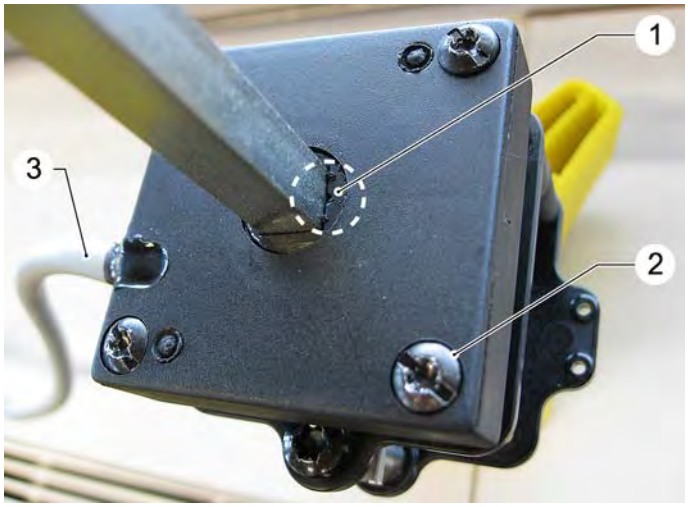
➔ Open the operating panel.

➔ Pull out the plug on the printed circuit board on the operating panel and remove the drive switch with drive lever.



1 Driving lever
2 Drive switch
3 Square
4 Plug, drive switch

Observe during installation:



1 Notch
2 Countersunk bore
3 Connecting cable

➔ The notch in the small bushing must be across from the connecting cable.

Note

The notch will not be visible until the safety ring is removed.

1 Countersunk bore

➔ Install the potentiometer so that the countersunk bores point toward the screw head.

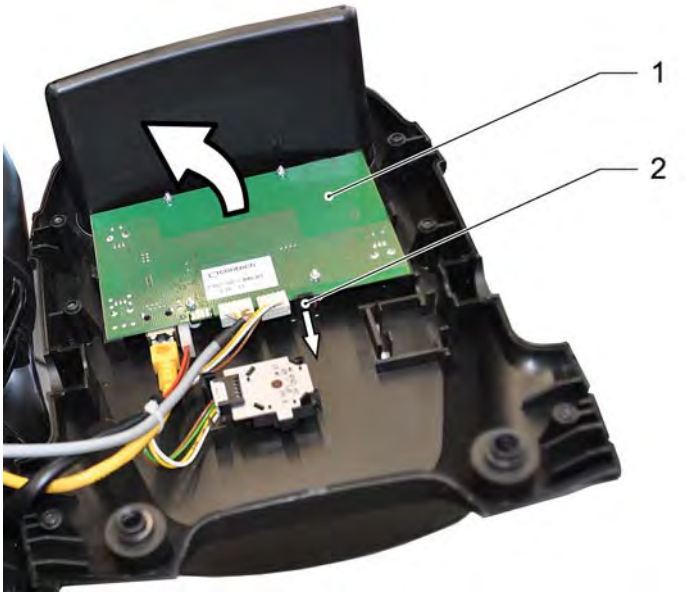
The following faults can occur in case of incorrect installation:

– The appliance is moving backwards instead of forward.
– The display shows "Release gas pedal" even though it has not been pressed.

6.2.5 Replacing the control panel board

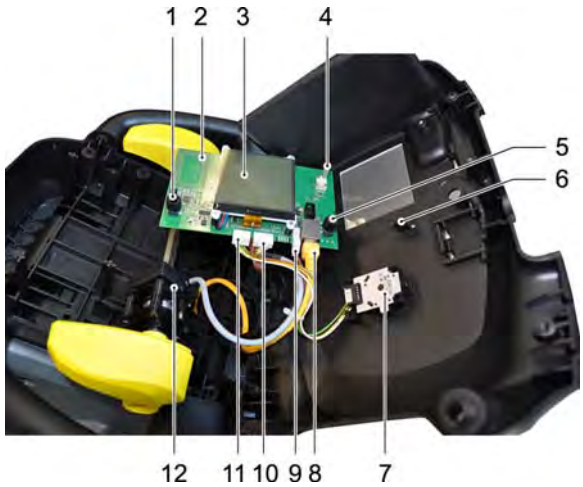
1 Info button
2 Water quantity regulator
3 Program selection switch
4 Rotating button for drive speed

➔ Open the operating panel.
➔ Pull off the info button, regulator button for the water volume, programme selector switch and the rotary knob for the drive speed.



1 Operating panel board
2 Holder, operating panel PCB

➔ Press the holder of the operating panel PCB slightly toward the outside and remove the operating panel PCB.



1 Rotating button for drive speed
2 Antenna for key signals
3 Display
4 Info button
5 Water quantity regulator
6 Holder, operating panel PCB
7 Program selection switch
8 Plug, CAN-BUS to control electronics
9 Plug (K0), connection to control electronics
10 Plug, programme selector switch
11 Plug, drive switch
12 Drive switch

➔ Disconnect all plugs from the operating panel PCB.

6.2.6 Check the self-test

Check whether a fault is present at the control panel board or the control electronics.

1 Plug (K0), connection to control electronics
2 Jumper

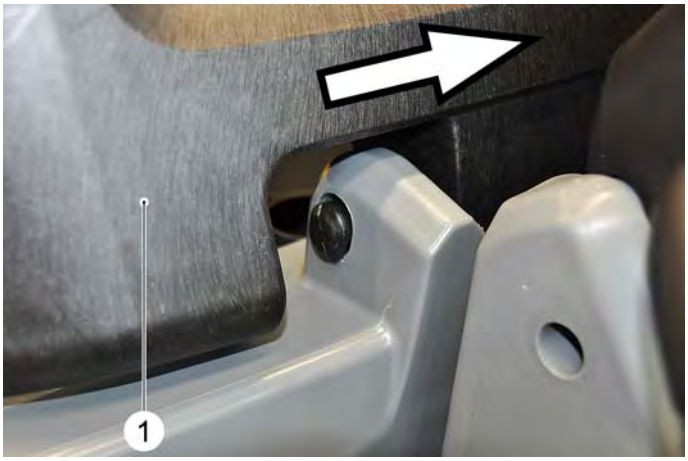
➔ Open the operating panel.
➔ Remove the plug.
➔ Bridge plug contacts.

If there is no fault on the control panel board, the device will switch on immediately, even if no KIK key has been inserted.
The battery indicator is displayed when the KIK key is inserted.
None of the device's functions are available.

Caution

If the polarity is reversed (positive and negative terminals), the control electronics are destroyed.

6.3 Unhook the cover of the wastewater reservoir



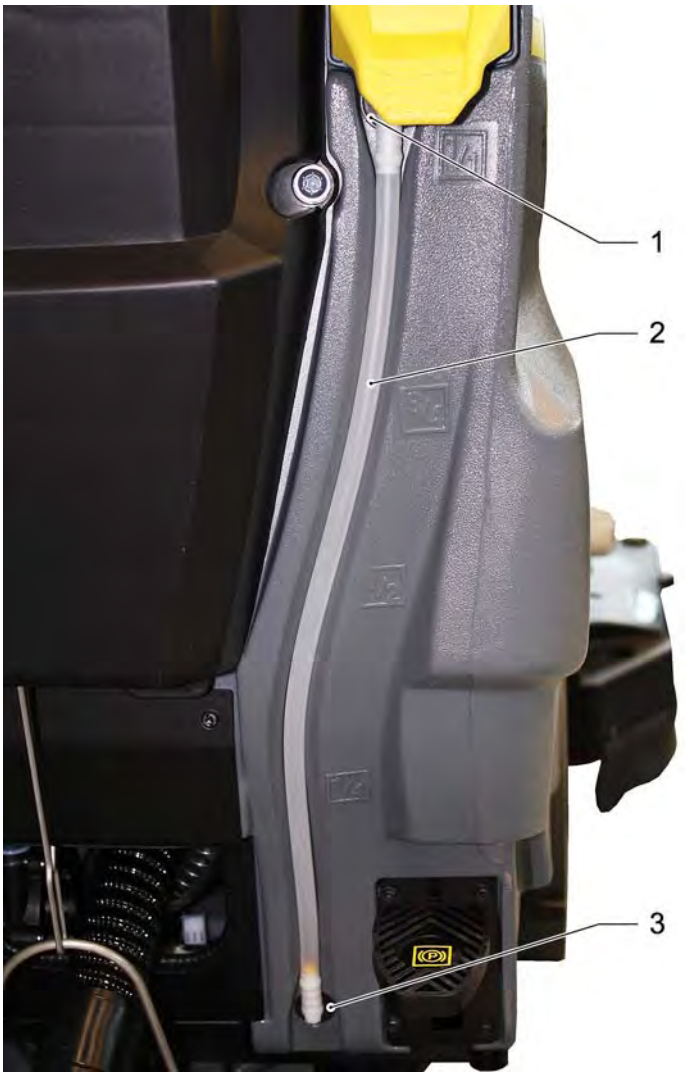
1 Cover dirt water reservoir

➔ Open the cover.

➔ Slide the cover to the side.

➔ Remove the lid.

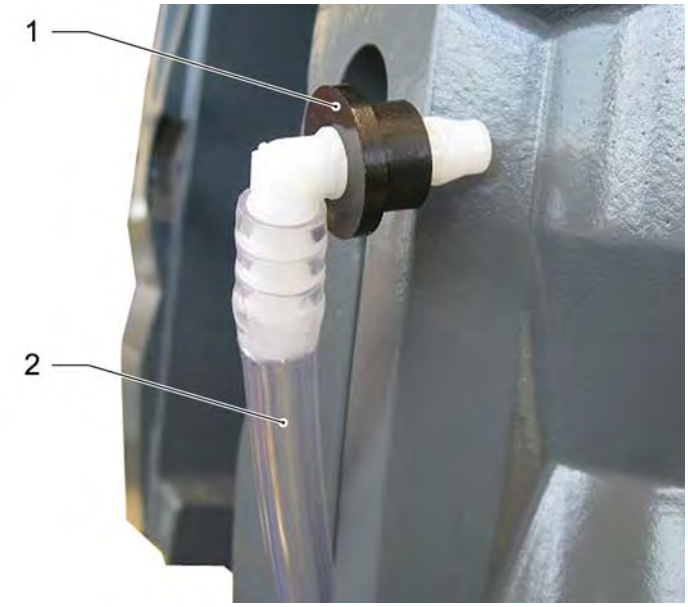
6.4 Replace the fill level indicator



1 Top rubber grommet

2 Filling level display

3 Bottom rubber grommet



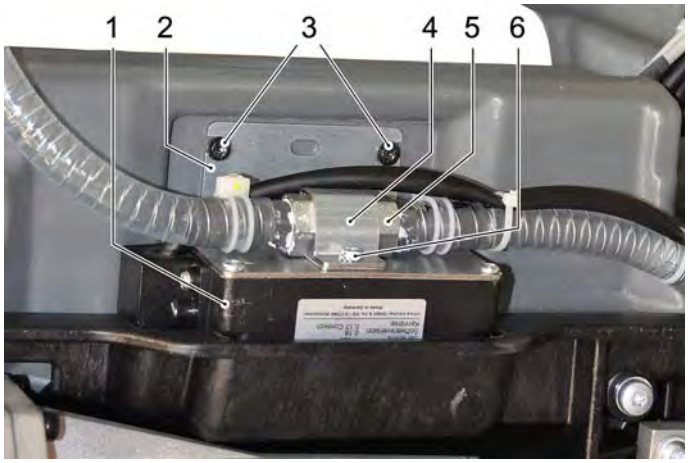
1 Rubber grommet

2 Filling level display

➔ Remove the rubber grommets with a screwdriver.

6.5 Replace the water dosing unit

6.5.1 Replace water dosing valve



1 Water dosing valve

2 Angle plate

3 Screws

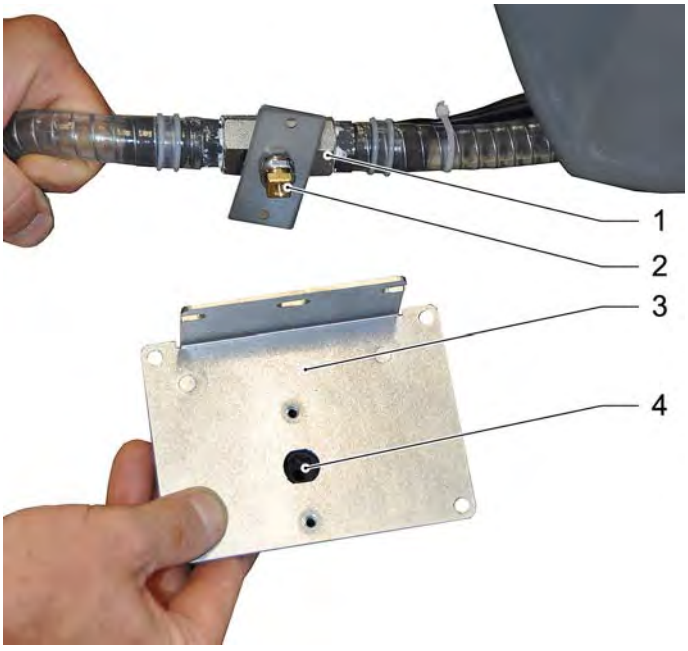
4 Halting plate

5 Ball tap

6 Screws

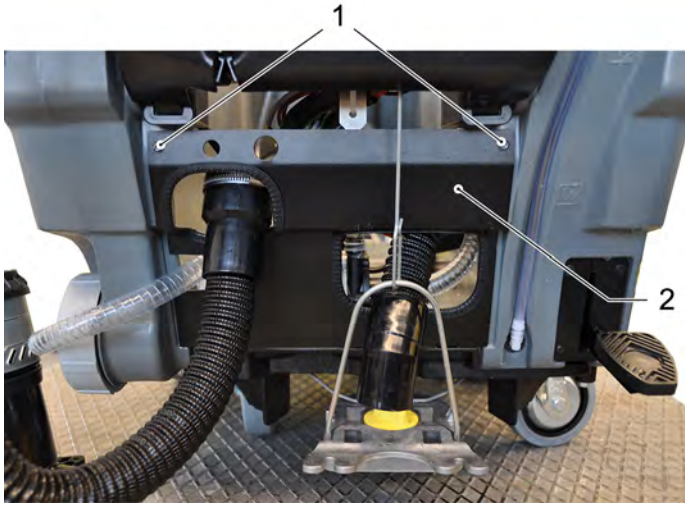
1 Screws
2 Water dosing valve
3 Angle plate
➔ Unscrew the screws.
➔ Remove the water dosing valve.
➔ Loosen the screws on the support plate.
➔ Remove the ball cock from the water dosing valve.
➔ Remove the connecting cable from the water dosing valve.

6.5.2 Replacing the ball cock

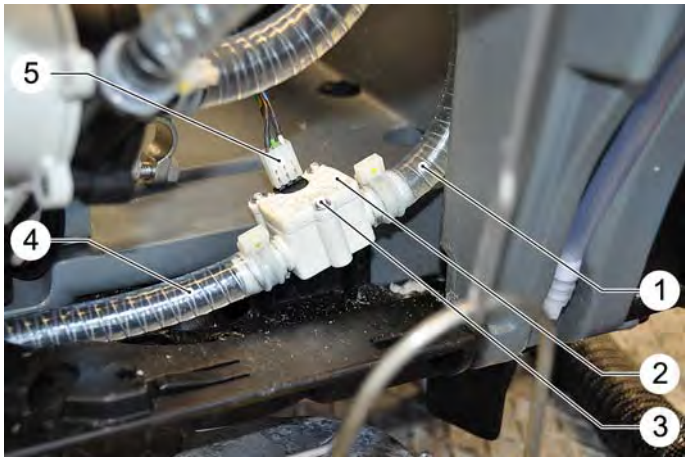


1 Ball tap
2 Ball cock actuator
3 Angle plate
4 Pick-up of ball cock actuator
➔ Remove the screws from the support plate.
➔ Remove the ball cock from the angle plate.
➔ Separate the hose connections from the ball cock.

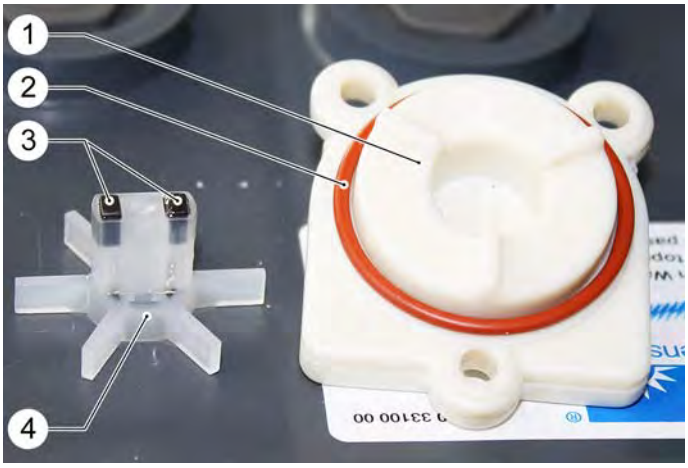
6.6 Clean the flowmeter



1 Screws
2 Cover
➔ Unscrew the screws.
➔ Remove cover.

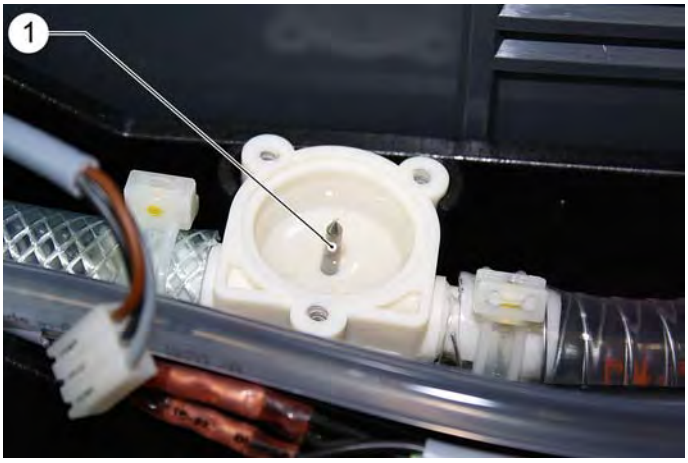


1 Fresh water hose from the fresh water tank
2 Flowmeter
3 Screws
4 Fresh water hose to the brush head
5 Cable plug
➔ Remove the cable plug.
➔ Unscrew the screws.



1 Lid, flowmeter
2 Seal ring
3 Magnets
4 Rotor

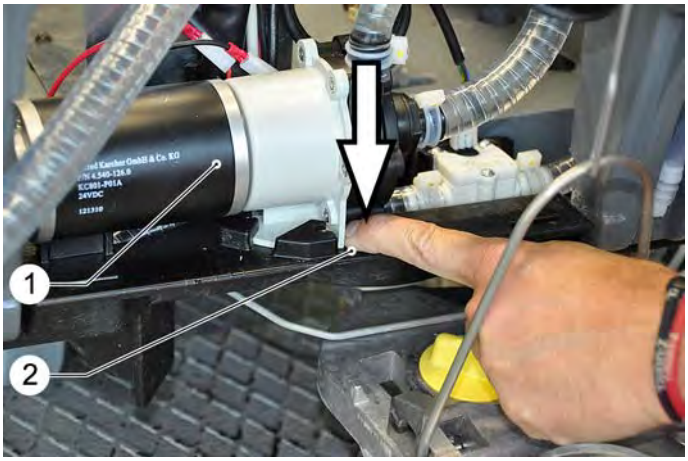
➔ Remove the lid and the rotor from the flowmeter.



1 Rotor axis

➔ Clean the rotor axle and the interior.

6.7 Replacing the water pump



1 Water pump
2 Locking nose

➔ Press the locking nose down.

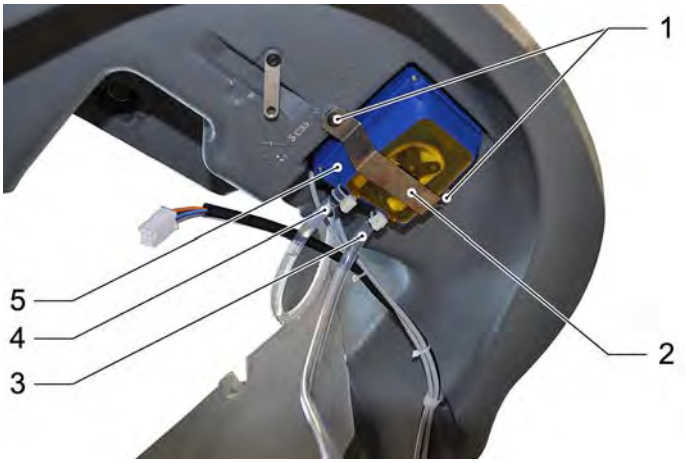
1 Plug contacts
2 Water pump
3 Water hoses

➔ Disconnect the plug-in contacts.

➔ Remove the water hoses.

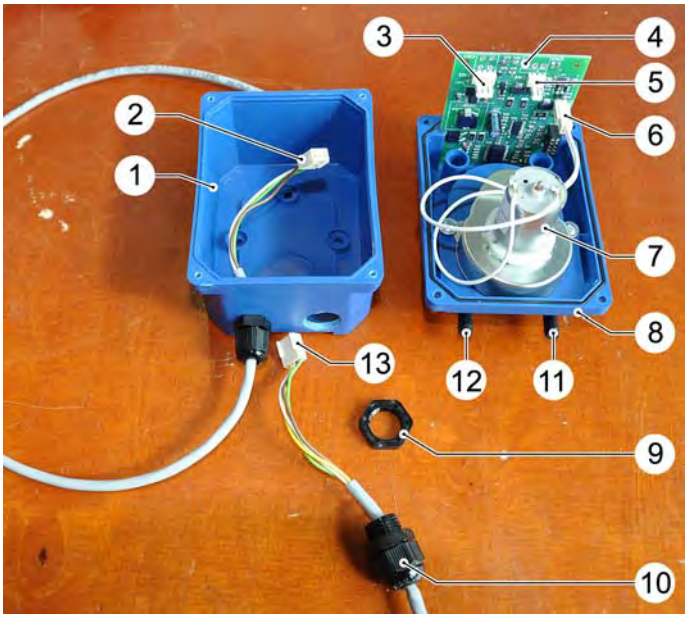
6.8 Detergent dosing (DOSE)

6.8.1 Replace the detergent dosing



1 Screws
2 Halting plate
3 Detergent hose to the fresh water hose
4 Detergent hose from the detergent container
5 Detergent dosing (DOSE)

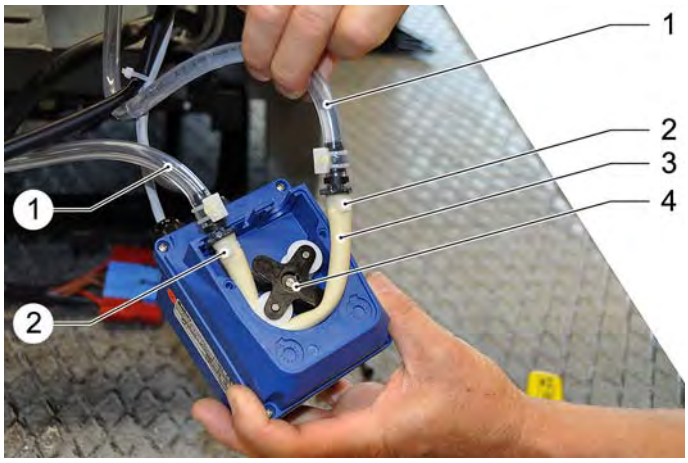
➔ Unscrew the screws.
➔ Remove the detergent hoses from the detergent dosing.
Hold the detergent hoses up and secure them to prevent detergent from leaking out.
➔ Remove the cable.



Detergent dosing open

1 Casing bottom
2 Signal cable from flowmeter
3 Plug-in contact supply/control cable
4 Control chip
5 Plug contact signal cable
6 Motor connection
7 Motor
8 Housing top
9 Cable screw connection, nut
10 Cable screw connection
11 Hose connection, detergent hose from the detergent container
12 Hose connection, detergent hose to the fresh water hose
13 Supply/control cable

6.8.2 Replacing the pump hose



1 Detergent hose
2 Cable connector
3 Pump hose
4 Pump wheel

➔ Remove the detergent pump.
➔ Remove the lid.
➔ Remove the pump hose from the pump wheel.
➔ Remove the cable ties.
➔ Remove the pump hose.
➔ Install the new pump hose.
➔ Check the function of the pump.

6.9 Tank rinsing system

6.9.1 Replace the hose ring with nozzles

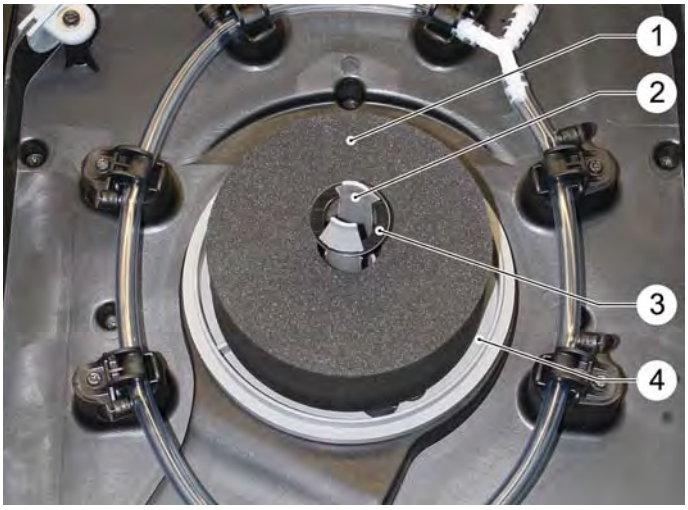
1 Protective cover
2 Hose connection
3 Hose ring
4 Nozzle with holder

1 Hose ring
2 Screw
3 Nozzle with holder

➔ Remove the protective cap.
➔ Loosen screws.
➔ Remove the screws from the hose clamp.
➔ Remove the hose ring with nozzles.

6.10 Float

6.10.1Replace the float



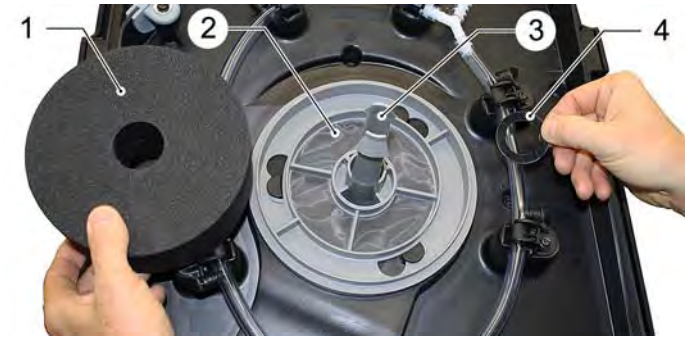
1 Float
2 Pickup mandrel
3 Disc
4 Fluff filter

➔ Compress the pickup mandrel.

➔ Remove the float.

Note

Make sure that the disc is installed. It prevents the floater from slipping across the intake mandrel and losing its function.



1 Float
2 Fluff filter
3 Pickup mandrel
4 Disc

6.10.2Replace the lint sieve

1 Fluff filter

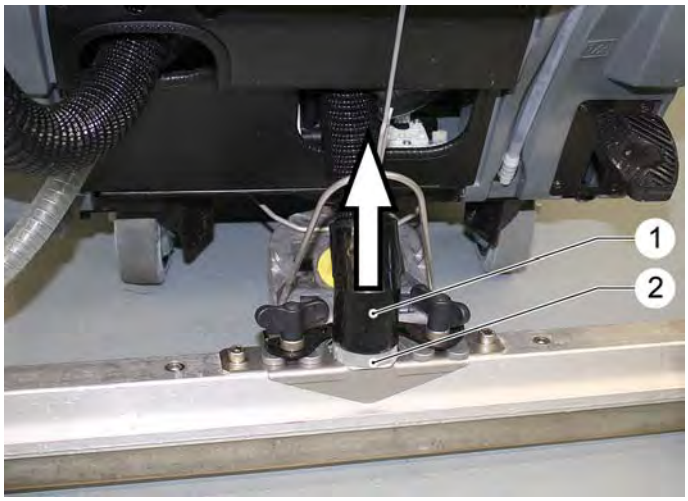
➔ Compress the pickup mandrel.

➔ Remove the float.

➔ Rotate the lint sieve counter-clockwise and remove it.

➔ Clean or replace the lint sieve if necessary.

6.11 Replace suction hose.



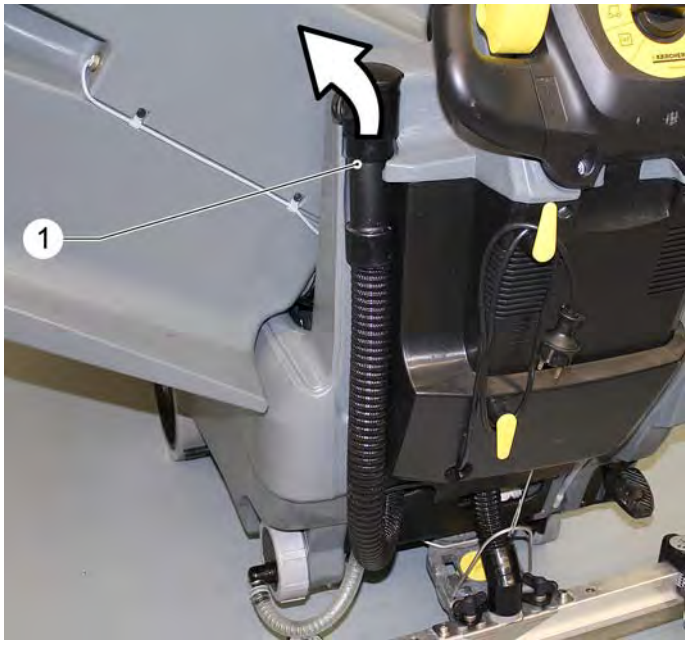
1 Suction hose
2 Vacuum bar

➔ Pull out the suction hose from the vacuum bar.

1 Suction hose
2 Dirt water reservoir
➔ Empty the dirt water reservoir.
➔ Tilt the wastewater reservoir on its side.
➔ Pull out the suction hose off of the wastewater reservoir.

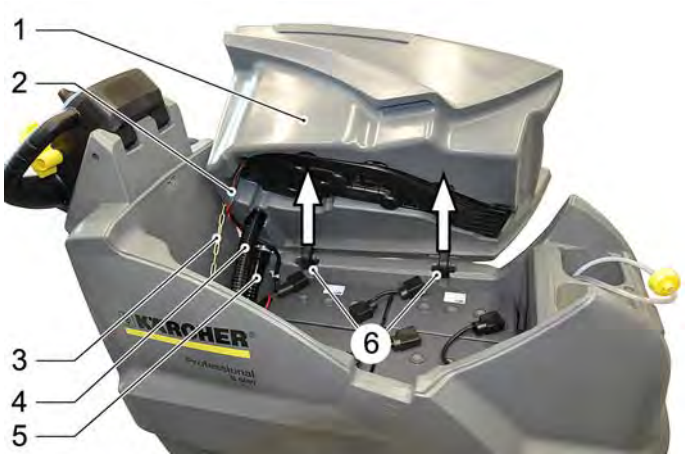
6.12 Replace the wastewater drain hose

1 Hose clip
2 Dirt water reservoir
3 Dirt water drain hose
➔ Empty the dirt water reservoir.
➔ Tilt the wastewater reservoir on its side.
➔ Loosen the hose clip.
➔ Wastewaster drain hose off of the wastewater reservoir.

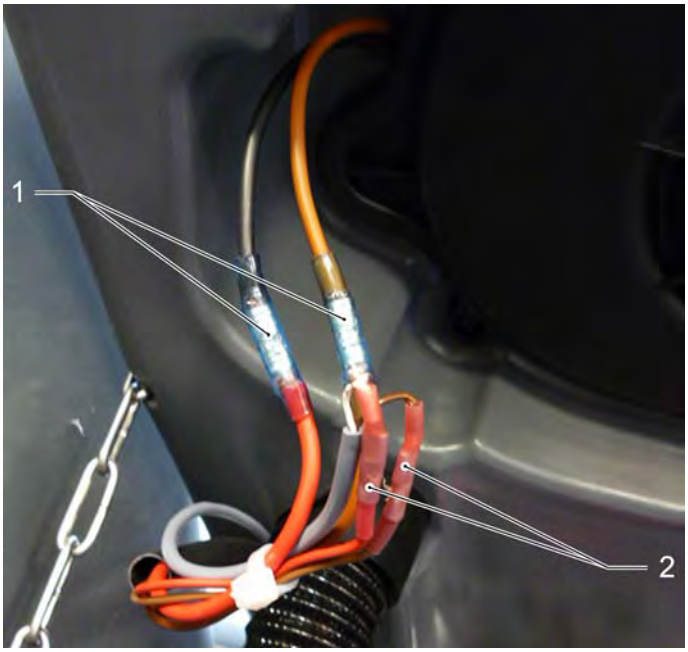


1 Dirt water drain hose
➔ Remove the wastewater drain hose.

6.13 Removing the wastewater reservoir

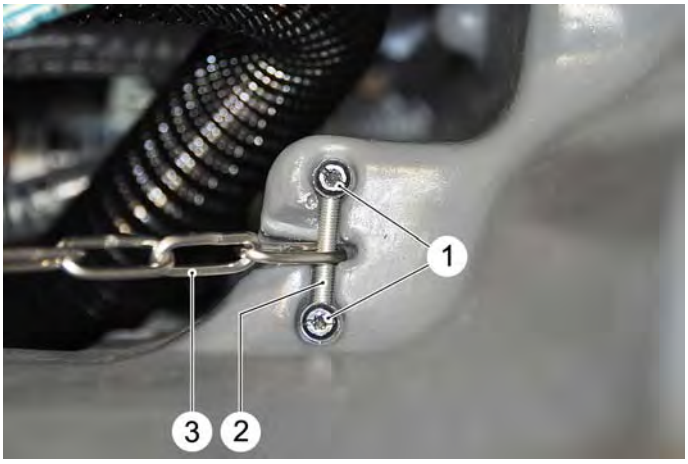


1 Dirt water reservoir
2 Connecting cable of the suction turbine and float of wastewater reservoir
3 Coil Chain
4 Suction hose
5 Dirt water drain hose
6 Cover hinges
➔ Empty the dirt water reservoir.
➔ Tilt the wastewater reservoir on its side.
➔ Pull out the suction hose off of the wastewater reservoir.
➔ Remove the wastewater drain hose.



1 Connection cable suction turbine
2 Connecting cable float of wastewater tank

➔ Separate the connecting cable of the suction turbine from float of wastewater reservoir.

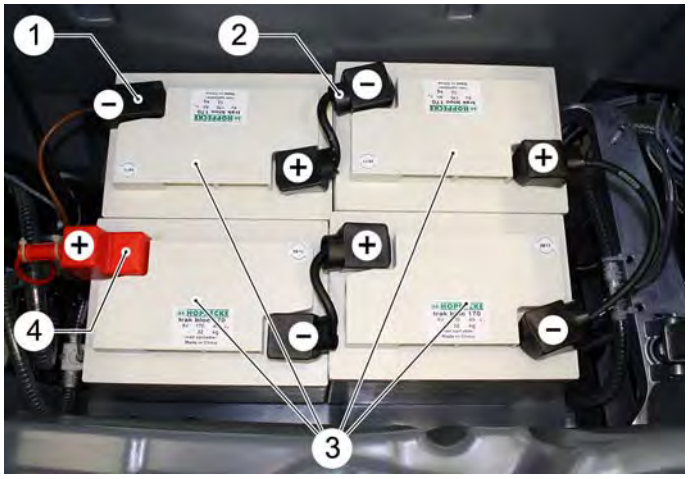


1 Screws
2 Threaded bolt
3 Coil Chain

➔ Unscrew the screws.
➔ Remove the threaded bolt.
➔ Remove the wastewater reservoir with cover hinges from the appliance.

6.14 Battery and battery charger

6.14.1Removing the batteries



1 Negative terminal (under the protective cap)
Appliance battery connection
2 Battery terminal connector
3 Batteries
4 Positive terminal with main fuse (under the protective flap)
Appliance battery connection

➔ Empty the dirt water reservoir.
➔ Tilt the wastewater reservoir on its side or remove it.
➔ Loosen the terminal screw connections and remove them from the terminals.
➔ Remove the batteries.

6.14.2Check the maintenance-free batteries

The battery must be fully charged prior to the inspection to obtain a reliable result.
The following checks must then be made:

Measurement of the idle voltage

The idle voltage provides a measure for the charging status of a maintenance-free battery.
If this value is below a certain limit, this indicates that the battery is not charged.
You can estimate the approximately available charge from the idle voltage.
The following values apply with:
Exide gel batteries

6 volt block battery		**Charge approx.**
> 6,42	Volt	100 %
> 6,30	Volt	75 %
> 6,20	Volt	50 %
> 6,00	Volt	25 %
> 6,00	Volt	Deep discharge

The idle voltage should reach at least 6.15 Volts.
If these values are not met, the battery must be charged first.
Hoppecke AGM Fleece Batteries

6 volt block battery		**Charge approx.**
> 6,46	Volt	100 %
> 6,30	Volt	75 %
> 6,15	Volt	50 %
> 6,00	Volt	25 %
> 5,85	Volt	Deep discharge

The idle voltage should reach at least 6.36 Volts.
If these values are not met, the battery must be charged first.

6.14.3Check the maintenance-free batteries

The battery must be fully charged prior to the inspection to obtain a reliable result. The reason for this is that the acid layer is not removed until the charge is depleted due to the initiated electrolysis.
Measuring the acid density during charging is prohibited.
Check the battery fluid level and refill distilled water if necessary. If water is refilled, a charge must be conducted before measuring the idle voltage.
The following checks must then be made:

Measuring idle voltage (quick test)

6 volt block battery	6,36-6,45	6,18	5,91	<5,91
Charge condition about (%)	100%	50%	20%	Deep discharge

The idle voltage should reach at least the limit value of 6.10 Volts.
If these values are not met, the battery must be charged first.

Measuring the acid density with the battery acid meter (quick test)

Acid density (kg/l)	1,29	1,21	1,13	<1,13
Charge condition about (%)	100%	50%	20%	Deep discharge

The difference between the battery blocks/battery cells should not exceed 0.04 kg/l. If a battery block / a battery cell is outside this tolerance, this battery block / battery cell must be replaced.

Battery acid meter

Practice:

The above mentioned values are guide values at 30 °C temperature.
In practice, the battery temperature influences the acid density and the voltage.
Rule of thumb:
1. 15 °C deviation from 30 °C changes the measuring value of the density by 0.01 kg/l.
2. Acid density + 0.84 ~ idle voltage of battery cell.

Measuring the battery under load

With all measurements, the difference must not exceed the following voltage under load:
Exide batteries:

- between the 6 volt battery blocks 0.1 volts

Hoppecke batteries:

- between the 6 volt battery blocks 0.2 volts

If the difference between the battery blocks/battery cells is larger, the battery block/battery cell with the lowest voltage must be replaced.

6.14.4 Measuring the battery voltage under load

Note

The battery terminals must be checked prior to the load test.

The battery terminals must always be clean and tight.

➔ Switch the appliance on and take the suction turbine and the cleaning head into operation on an insensitive floor.

Important: The consumers must run continuously during this test.

The load test can also be performed while the suction turbine is turned on.

➔ Use a voltmeter / multimeter to measure and record the battery voltage of every individual battery block.

Measure the current using a clip-on ammeter during the voltage measurement and record it.

➔ The battery block with the lowest battery voltage must be replaced if it is outside the tolerance values.

See item "Limit value of battery voltage between the individual battery blocks".

If this procedure still does not indicate clearly that there is a faulty cell, the third measurement must be performed after the second load test.

6.14.5 Measuring the battery voltage under load until the appliance shuts off

➔ Use a voltmeter / multimeter to measure and record the battery voltage of every individual battery block.

Measure the current using a clip-on ammeter during the voltage measurement and record it.

➔ Operate the appliance until the discharge end voltage / the total discharge protection shuts the appliance off.

Result

In case of a problem, one or more battery blocks / battery cells will be significantly different from each other so that the fault can be pinpointed without doubt.

Limit value – battery voltage between the individual battery blocks for maintenance-free and low-maintenance batteries.

With all measurements, the different must not exceed the following voltage under load:

Exide batteries

– between the 6 volt battery blocks 0.1 volts

Hoppecke batteries

– between the 6 volt battery blocks 0.2 volts

Battery measuring log - maintenance-free battery		
1. Measurement - idle voltage Measure the idle voltage with charged battery without consumers.		
Battery block	1	2
	3	4
2. Measurement - load test Measure the battery voltage several times while the turbine is turned on.		
Battery block	1	2
	3	4
3. Measurement - load test Measure the battery voltage while the turbine is turned on, shortly before the discharge end voltage is triggered.		
Battery block	1	2
	3	4

Record further machine data			
Appliance type:		Battery type:	
Order number of appliance:		Manufacturer:	
Serial number:		Part number:	
Purchase date:			
Operating hours of appliance:			Hours
Have the pole clamps been tightened?			
Are damages visible on the battery?			
Current pickup	Drive motor		Ampere
	Suction turbine		Ampere
	Brush motor		Ampere
	All consumers during cleaning.		Ampere
Discharge end voltage	When does the discharge end voltage get triggered.		Volt
Runtime indication	How long was the customer able to work with the appliance when the batteries were still fully functional?		Hours / minutes
Battery date	Is indicated near the battery terminal on the battery.		Date or code
How long / how often is the appliance used per day / per week?			Hours / day
			Hours / week

6.14.6Notes regarding the battery

Replacing a maintenance-free battery due to old age

If the 6 volt battery blocks have reached more than 100 loading cycles or if they have been in use for more than 6 months, replacing the battery block with a new one is no longer worth it. We recommend replacing the entire battery set.

Taking out of operation

If batteries are not to be used for a while, the following must be observed when storing them:

- Disconnect the negative battery connection on the battery and store the cable so that it cannot inadvertently come into contact with the negative terminal of the battery.
- Only store batteries while charged.
- The storage location should be cool (the self-discharge rates will be lower).

Maintenance-free batteries:

- Recharge once the battery capacity is lower than 60%.

Maintenance-free batteries:

- Monthly test of the acid density.
- Recharge once the density has fallen below 1.23 kg/l.

Discharge end voltage or total discharge protection

The settings of the discharge end voltage must be checked to ensure that the runtime of the machine is not limited and that the battery cannot deeply discharge.

6.14.7Check the final discharge voltage

Final discharge voltage with variable value

The final discharge voltage is variable and is regulated automatically, so that the max. admissible battery capacity can be taken out without damaging the batteries.

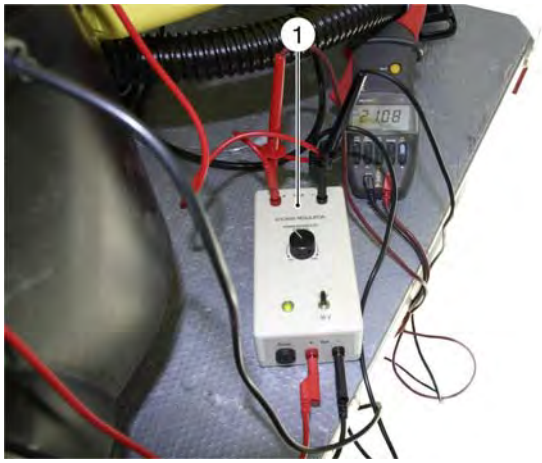
If a lot of current is taken, the final discharge voltage is deeper than with smaller current volumes.

The variable value can be monitored in debug mode. What is important, is that the correct battery is set up in the battery manager.

Function of the final discharge voltage

All units are operated until the variable value is reached. The brush motor shuts off with a time delay of 60 seconds and "Battery depleted" is displayed on the display. The suction turbine continues to run until the trailing time has elapsed and then shuts off.

The drive motor can be used until the voltage has reached the set value of 18 volts. This will also shut the drive motor off.



1 Voltage regulator

Checking the fixed value with the voltmeter.

➔ Tilt the wastewater reservoir on its side.

➔ Connect the voltage regulator in the power circuit.

➔ Plug in the Intelligent Key.

➔ Turn the programme selection switch to Programme 4 - intense mode - wet floor cleaning. Do not press the drive lever.

➔ Reduce the voltage slowly to the discharge voltage that is defined in the setup menu.

Target value:

- See Table for Shut-off voltage in chapter "Battery menu" (entry at A = 10 A).

Note

The switching off takes place with a 60 second delay.

As an alternative, you can check the total discharge protection using the voltmeter or the voltage tester.

➔ Connect the voltmeter directly to the battery and operate the appliance until the display shows "Battery depleted".

➔ At that moment, read the battery voltage.

In this case, the brush motor and the turbine shut off. With the model ---W BP, the drive motor is still active.

Important: The voltage test must take place under load.

6.14.8Test the charger

➔ Connect the charger to the batteries.

➔ Connect the voltage meter and clip-on ammeter to the batteries.

➔ Plug in mains connector and switch on charger.

➔ Determine the current and voltage measuring values after switching on the charger and record them.

➔ Determine the current and voltage measuring values after about 10 minutes and record them.

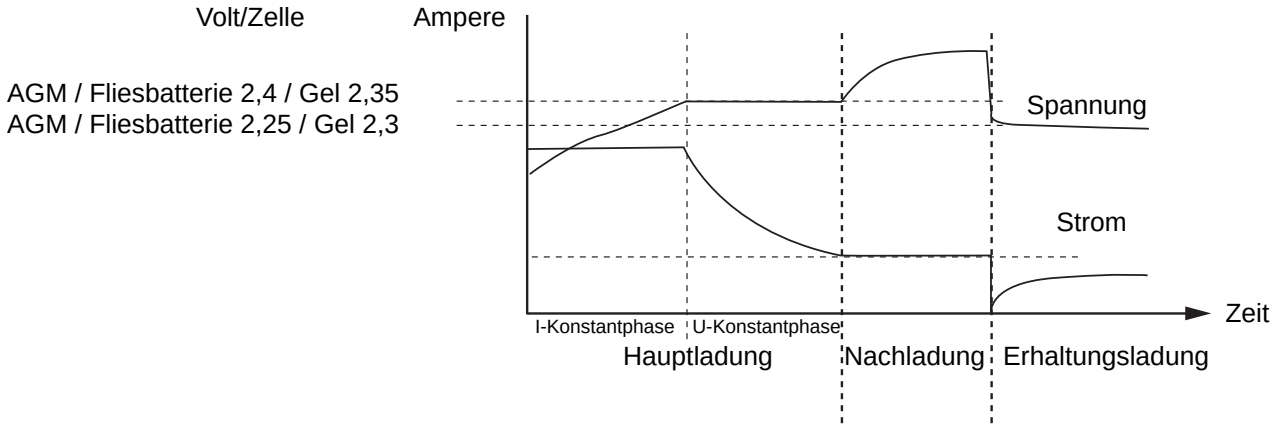
The measuring result of the I constant phase in the main charge must be close to the manufacturer's values of the charger.

See typeplate of charger.

Charger data:

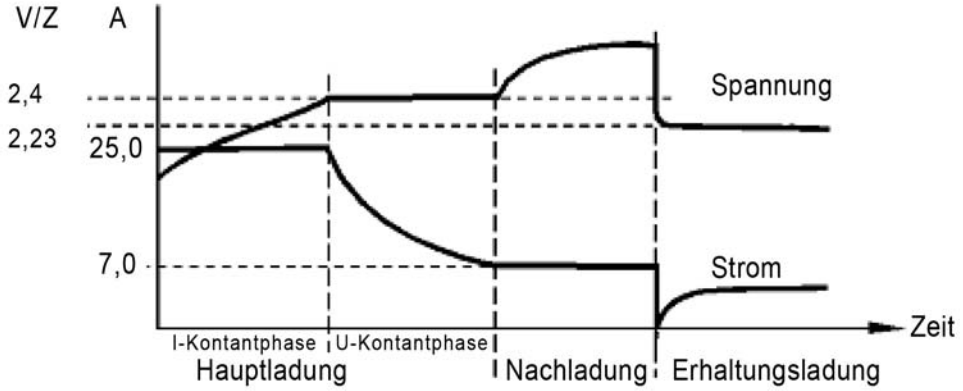
Appliance type:		Charge:	
Manufacturer		daily:	
Order number of appliance:		After each use:	
Serial number:		Weekly:	
Purchase date:		When was the last charge:	
Are damages visible on the battery?			
Performance values of the charger with the battery connected immediately after the start of the charging process (maximum, continuous current value):			
Charge voltage:			Volt
Charge current (constant current!):			Ampere
Performance values of the charger with the battery connected after approx. 10 minutes:			
Charge voltage:			Volt
Charge current (constant current!):			Ampere

Regulated charge ID line IUI charger for maintenance-free batteries



IUIa means:
I = constant current line
U = constant voltage line
I = constant current line recharging
a = automatic switch-off (transition to maintenance charge)

Regulated charge ID line IUI charger for low-maintenance batteries



IUIa means:
I = constant current line
U = constant voltage line
I = constant current line recharging
a = automatic switch-off (transition to maintenance charge)

- During the I constant phase, the charger is charged with the nominal current (see typeplate on charger) and the charge voltage will increase slower or faster depending on the charge condition. After that, the charger will switch to U constant phase.
- In the U constant phase, the voltage remains constant and the current sinks continuously. After that, the charger will switch to I constant phase.
- In the I constant recharging phase, the voltage will rise to the values indicated in the diagrams and the current value remains constant. After that, the charger will switch to maintenance charge.
- The recharging phase serves to achieve the complete transformation of the active mass in all cells.
- During the maintenance charge, the fully charged battery status remains at constant voltage. The maintenance charge has no time limits.

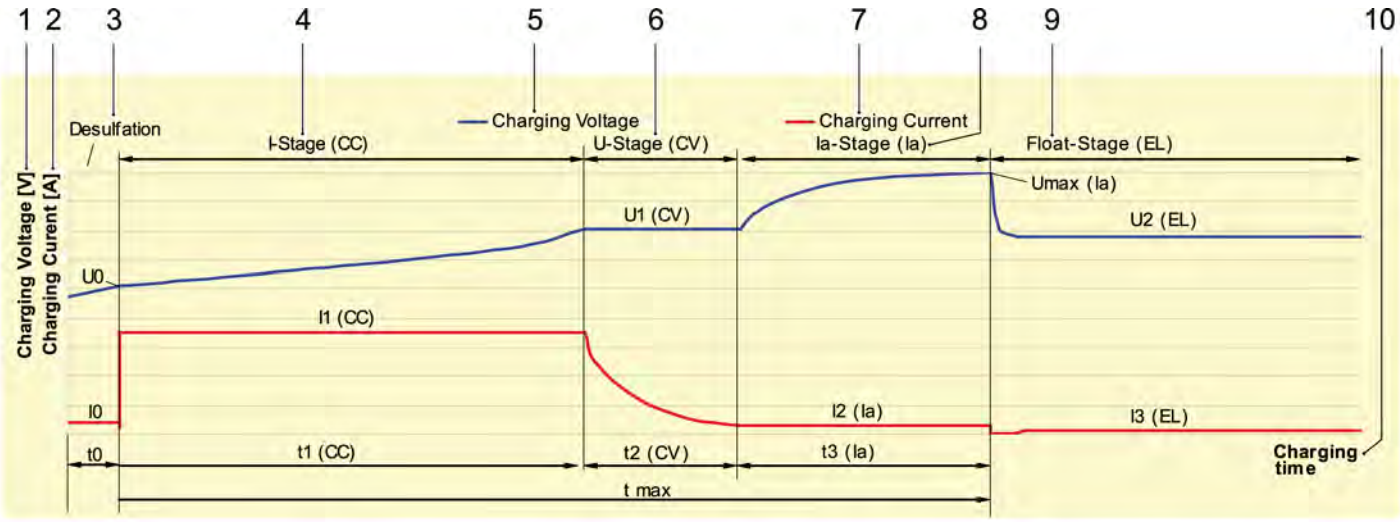
Display shows charging process

During the battery charging process, the battery status is shown on the display.
In case of battery problems, you must always ensure that the correct battery has been set up in the battery menu.
The charge parameters are adapted to the battery type.

6.14.9Charger characteristics

Different charging characteristics are saved in the control electronics, belonging to the respective batteries.
If a battery is to be used, for which there is no suitable charging characteristic, you must contact the battery manufacturer.

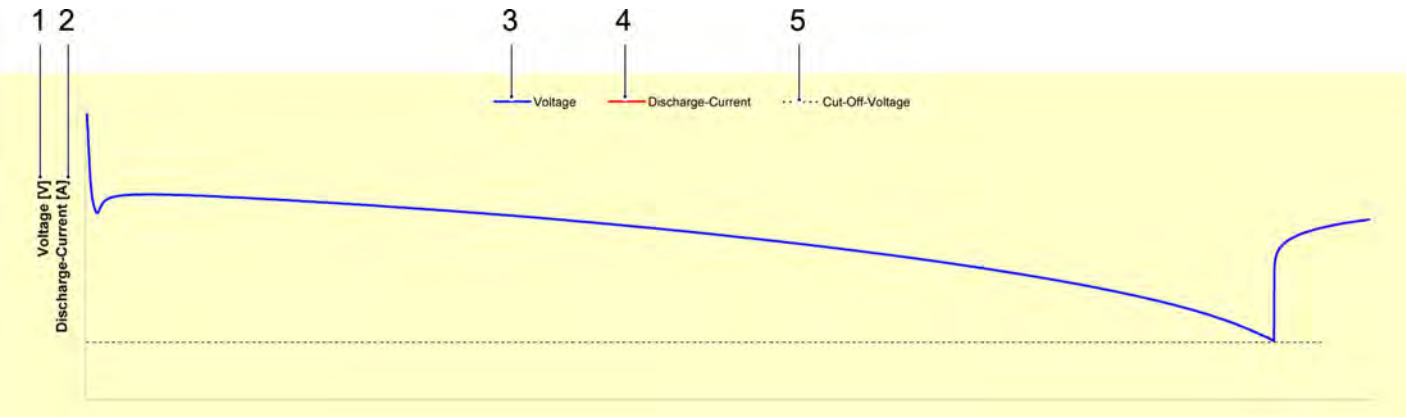
The following depicts the saved charging characteristics, which can be remedied with the battery manufacturer.



Charging characteristics, status of Feb. 3, 2012

1 Charge voltage [V]
2 Charge current [A]
3 Sulphating
4 I phase (CC)
5 Charge voltage
6 U phase (CV)
7 Charging current
8 Ia phase (Ia)
9 Retention charging (EL)
10 Charging time

Parameter	Battery Part number:	EXIDE GF12105V GEL 6.654-141.0	HOPPECKE 6TB170 AGM 6.654-242.0	EXIDE GF06 180V GEL 6.654-130.0	EXIDE GF06 240V GEL 6.654-119.0	EXIDE FT06 180 Wet WET 6.654-086.0
t0max	Max. time of the desulphating phase [min]	60	60	60	60	60
U0	Top threshold for the desulphating phase [V]	20,4	20,4	20,4	20,4	20,4
I0	Current in the desul-phating phase [A]	1,4	1,7	2,3	4,8	3,6
t1min	Minimum time for the I phase [min]	10	10	10	10	10
t1max	Maximale Zeit für die I-Phase [min]	540	540	540	540	420
I1	Current in the I phase [A]	18	27	27	35	28
t12max	Minimum time for the I+U phase [min]	720	840	720	720	600
U2	Conversion voltage from I to U phase [U]	28,2	28,8	28,2	28,2	28,8
t3min	Minimum time for the Ia phase [min]	60	120	60	60	60
t3max	Maximum time for the Ia phase [min]	240	300	240	240	240
t3 – Factor	Recharging time = (t1+t2)*t3 factor	1,0	0,5	1,0	1,0	0,6
I3	Current in the Ia phase [A]	1,6	2,3	2,3	3,1	9,0
Umax	Max. voltage in the Ia phase [U]	36	36	36	36	36
U4	Voltage during the retention charge [U]	27,6	27	27,6	27,6	26,8
I4	Maximum current during the retention charge [I]	1,6	2,7	2,3	3,1	9



Shut-off voltage of device, status of Feb. 3, 2012

1 Voltage [V]
2 Discharge voltage [A]
3 Voltage
4 discharge current
5 Switch-off voltage

Parameter	**Battery**	**EXIDE GF12105V**	**HOPPECKE 6TB170**	**EXIDE GF06 180V**	**EXIDE GF06 240V**	**EXIDE FT06 180 Wet**
		GEL	**AGM**	**GEL**	**GEL**	**WET**
	Part number:	**6.654-141.0**	**6.654-242.0**	**6.654-130.0**	**6.654-119.0**	**6.654-086.0**
	Discharge voltage [A]	**Shut-off voltage [V]**				
Low Batt A	20	23,4	23	23,5	23,6	23,2
Low Batt B	40	21,1	22,8	23,1	23,3	22,1
Low Batt C	60	19,6	22,7	22,3	22,9	21,1
Low Batt D	80	19,4	22,6	20,8	22,3	19,8
Low Batt E	100	19,2	22,5	19,9	21,3	19,6

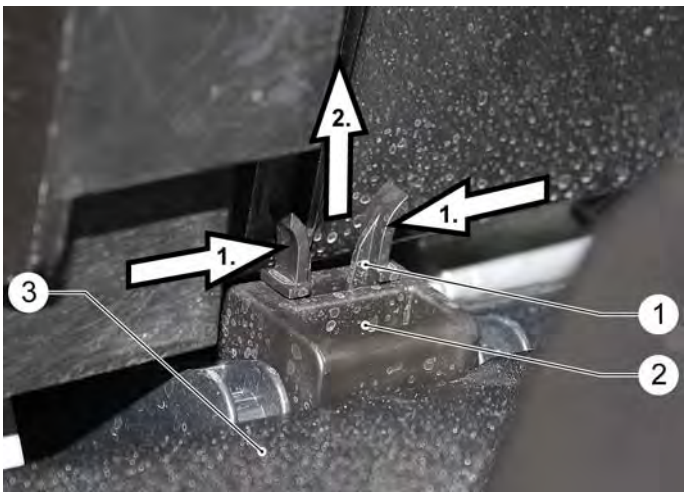
6.14.10Cable channel underneath the batteries

1 Cover, cable channel
2 Screws
➔ Remove batteries.
➔ Loosen screws.

1 Cable in the cable channel
2 Cover, cable channel
➔ Lift the cover.
The cables in the cable channel are freely accessible.

6.15 Brush head, BR model

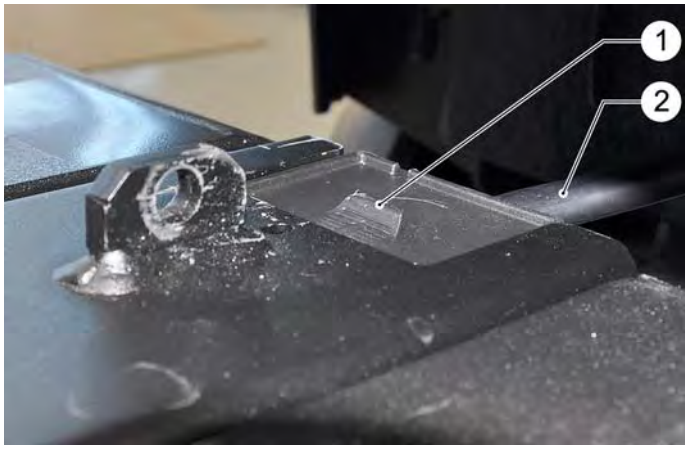
6.15.1Replace the brush head



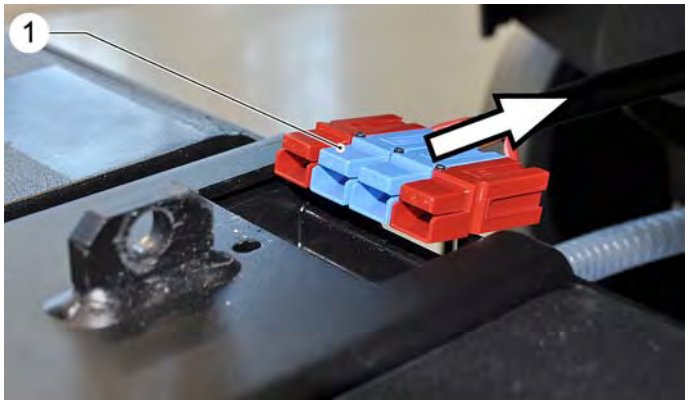
1 Retaining clip
2 Brush head pick up on the push bar
3 Brush head

➔ Switch to "Manual actuation" with the grey or red key.
➔ Select the brush head.
➔ Lower the brush head by pressing the I button.
Check the progress of the lowering.
➔ 1. Compress the holding clamp.
2. Pull the holding clamp all the way up and out.

1 Suspension
2 Brush head
3 Holding pin
4 Lock
➔ Push the lock back slightly and pull out the holding bolt.
➔ Raise the pick-up.



1 Lid, plug for mains connection
2 Connection cable of brush head
➔ Remove the lid of the power connection.



1 Brush head plug
➔ Remove the plug of the brush head.

1 Hose coupling

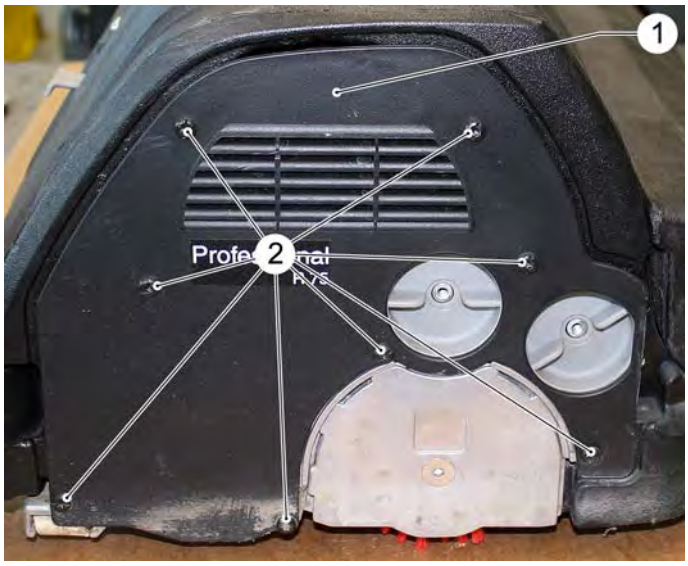
➔ Disconnect the hose coupling.

➔ Pull the brush head out toward the front.

Sequence of brush head installation:

1. Push the brush head in all the way to the push bar.
2. Insert the fastening clamps into the brush head pick-ups on the push bar.
3. Open the quick tensioning lever on the suspension.
4. Position the brush head under the suspension.
5. Switch to "Manual actuation" with the grey or red key.
6. Select the brush head.
7. Lower the suspension by pressing the I button.
   Check the progress of the lowering and adjust the brush head as needed.
   Lower the suspension enough for the holes on the suspension to be parallel to the pick-up on the brush head.
8. Slide in holding bolt.
   The holding bolt must be able to move easily without pressure.
9. Move the brush head back and forth slightly to remove any tension.
10. Close the quick tensioning lever.

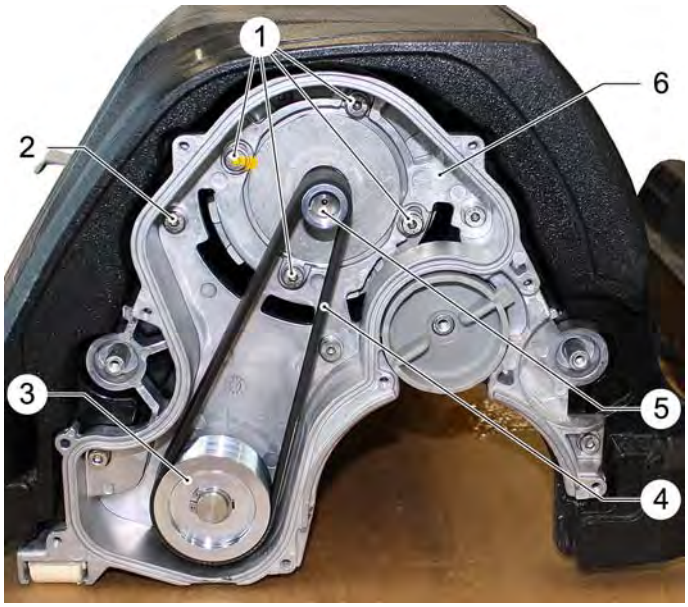
6.15.2Replacing the drive belt of the brush drive



1 Cover, drive belt

2 Screws

➔ Unscrew the screws and remove the lid.



1 Motor screws

2 Gear casing screws

3 Pulley

4 Drive belt

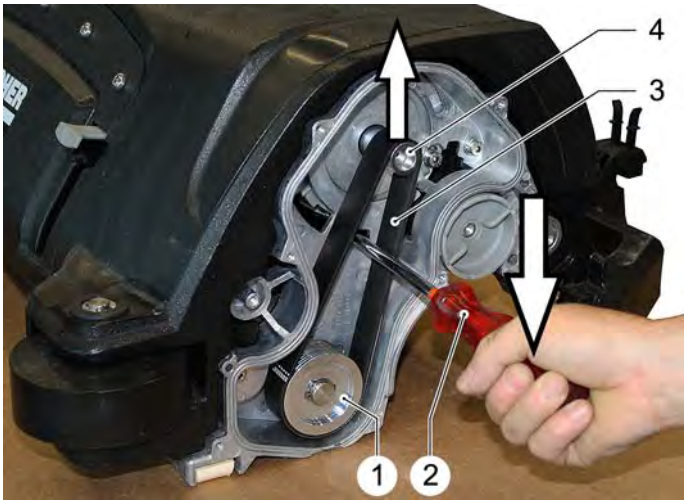
5 Drive pinion

6 Gear housing

➔ Loosen the screws on the motor.

➔ Remove the drive belt.

➔ Insert a new drive belt.



1 Pulley
2 Screwdriver
3 Drive belt
4 Drive pinion

➔ Lift the motor up with a screwdriver and tension the drive belt.

➔ Tighten the screws on the motor.

6.15.3Replace the pulley

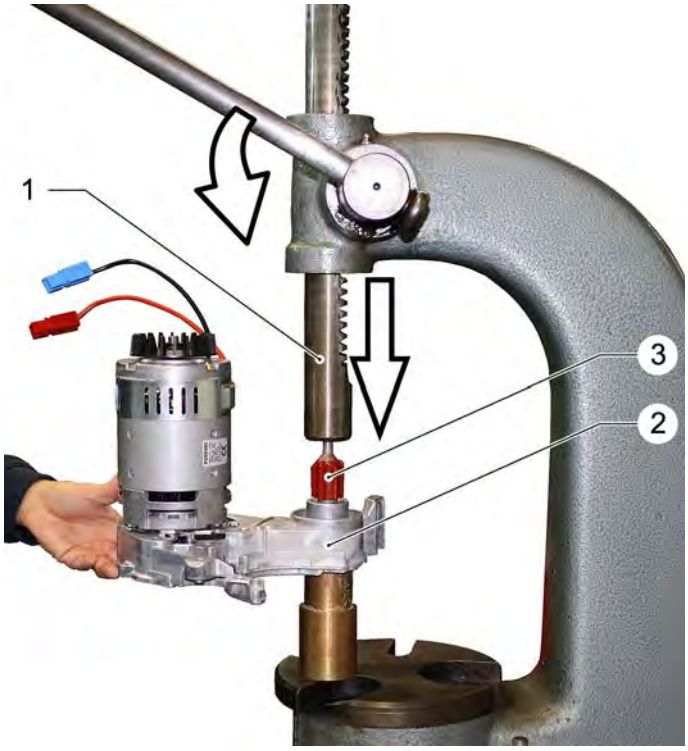
1 Safety ring
2 Pulley

➔ Remove the drive belt.

➔ Remove the safety ring.

1 Puller tool
2 Pulley

➔ Remove the pulley and replace it.



1 Press-in tool
2 Gear housing
3 Brush pick-up

➔ Press the pulley onto the brush pick-up by means of a press-in tool.

➔ Insert the safety ring.

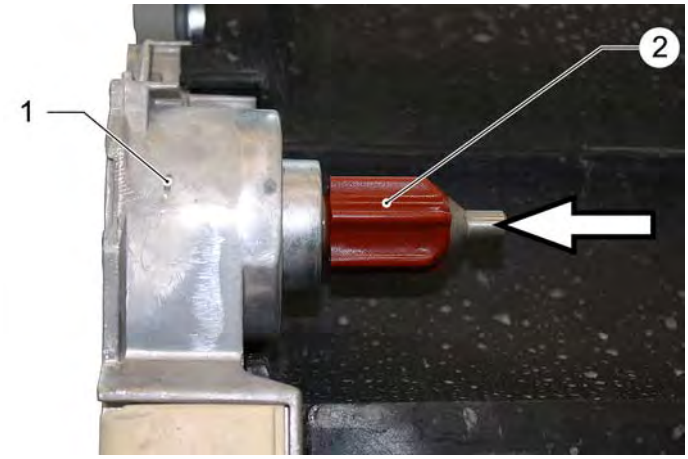
6.15.4Replace the axle on the brush intake

1 Safety ring
2 Axle

➔ Remove the brush rollers from the brush head.

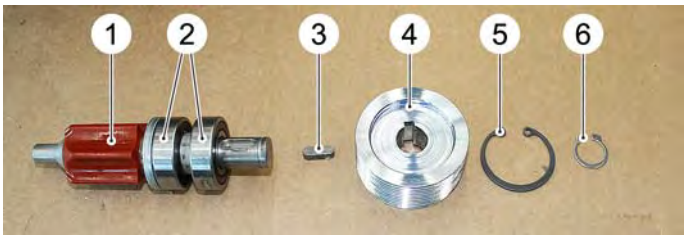
➔ Remove the pulley.

➔ Remove the safety ring.



1 Gear housing
2 Axle with brush roller intake

➔ Lightly strike the axle with a rubber hammer. Drive the axle out of the casing.



1 Axle with brush roller intake
2 Ball bearing
3 Fitting key
4 Pulley
5 Safety ring
6 Safety ring

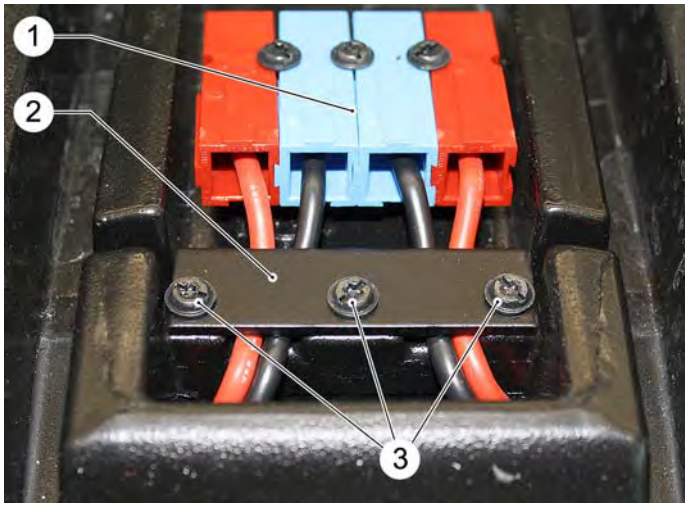
1 Rubber nose on the brush roller pick-up
2 Washer ring

The rubber nose is used to balance the brush width tolerances.
There is a seal ring on the ball bearing that prevents water from entering the ball bearing.

6.15.5Replace the brush motor

1 Cover of brush head plug
2 Screws

➔ Unscrew the screws.
➔ Remove the cover.



1 Brush head plug
2 Cable tension guard
3 Screws

➔ Unscrew the screws.
➔ Disconnect the plug elements.
➔ Remove the drive belt cover.

1 Brushing rollers
2 Screws

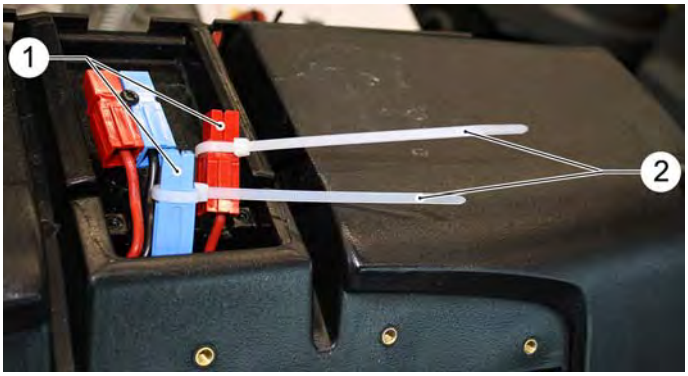
➔ Remove the brush rollers.
➔ Unscrew the screws and remove gear casing from the brush head.

1 Motor screws

➔ Unscrew the screws.

➔ Remove the motor from the gear casing.

Installation aid



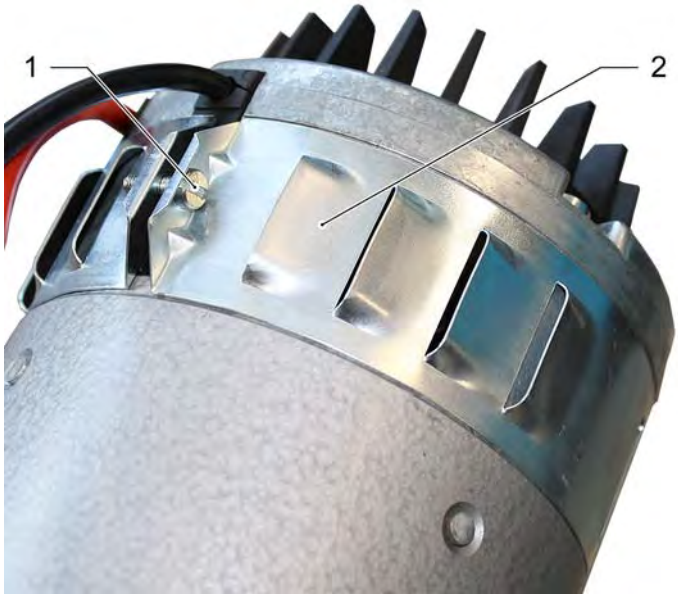
1 Plug elements

2 Cable connector

➔ Install a cable tie as a guide aid on every plug element.

The plug elements can be guided through the opening on the brush head easier by using cable ties.

6.15.6 Replace the glide contacts on the brush motor



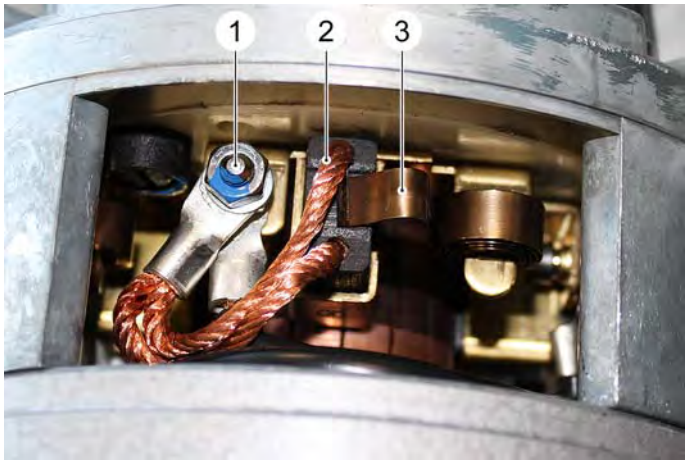
1 Screw

2 Cover, motor carbon

➔ Remove the brush motor.

➔ Loosen screws.

➔ Remove the cover of the motor carbon.



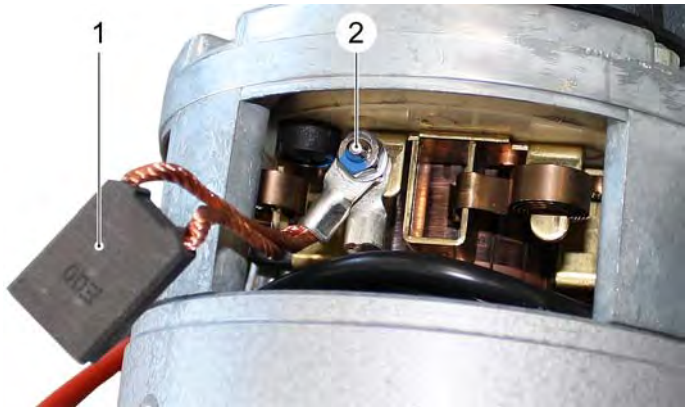
1 Nut, glide contact

2 Glide contact

3 Press spring

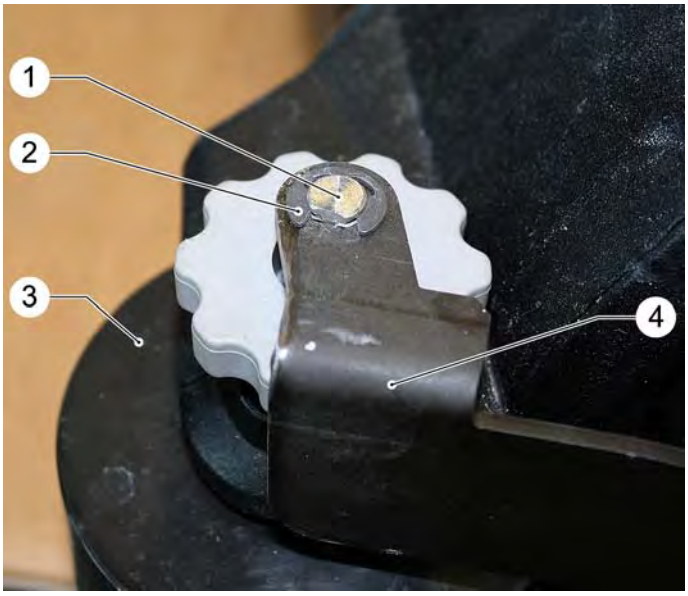
➔ Lift the contact spring and pull the glide contact out of the chute.

➔ Carefully place the contact spring onto the chute.



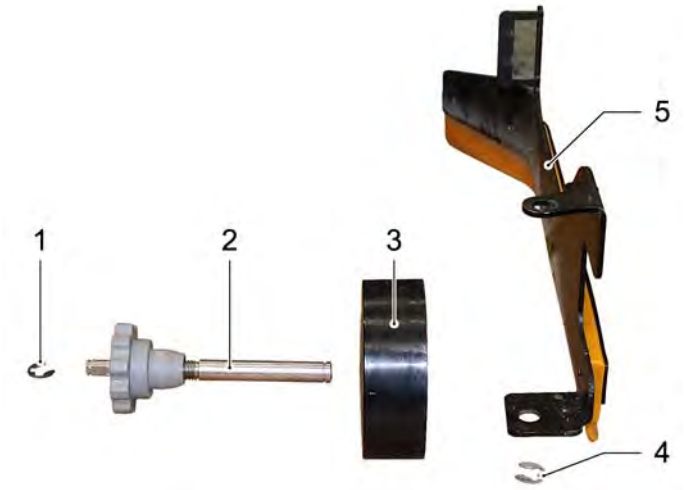
1 Glide contact
2 Nut, glide contact
➔ Unscrew the nut and replace the glide contact.
➔ Perform this procedure on both glide contacts.

6.15.7Replace the bow with sealing lip and deflector roller (BR model "S" only)



1 Axle bolt with star handle
2 Safety ring
3 Scraper roller
4 Bow with seal lip
➔ Remove the safety ring.

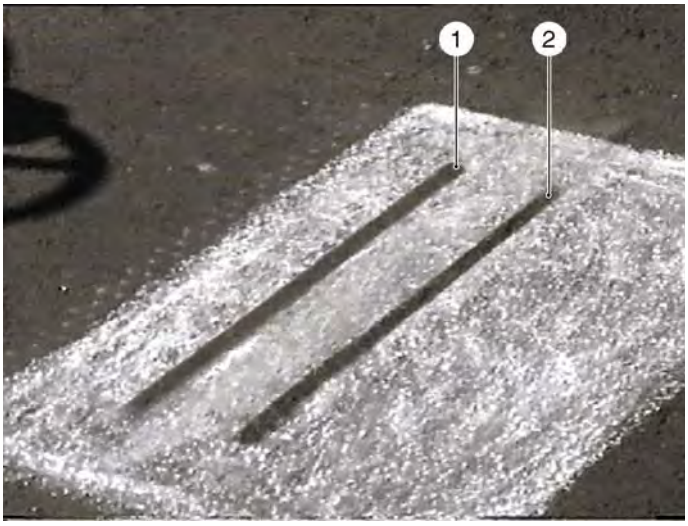
1 Axis pins
2 Safety ring
➔ Remove the safety ring.
➔ Remove the bow with seal lip from the axle bolt.
➔ Remove the axle bolt.



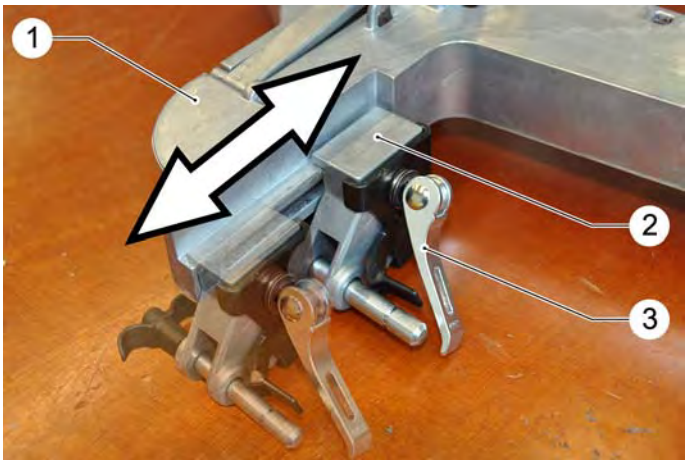
1 Safety ring
2 Axle bolt with star handle
3 Scraper roller
4 Safety ring
5 Bow with seal lip

6.15.8Setting the brush head

1 Brushing rollers
2 Screws
3 Gear housing
➔ Place the brush head on an even surface.
➔ Insert the brush rollers.
➔ Loosen the screws on both gear casings.
➔ Shake the brush head briefly for the brush rollers and the gear housing to settle.
➔ Tighten the screws.
➔ Coat a corresponding area of the floor with chalk and drive the brush head over it.
➔ Switch on the brush head, lower it and briefly brush the chalk-coated area.
➔ Raise the brush head and remove it from the chalk-coated area.



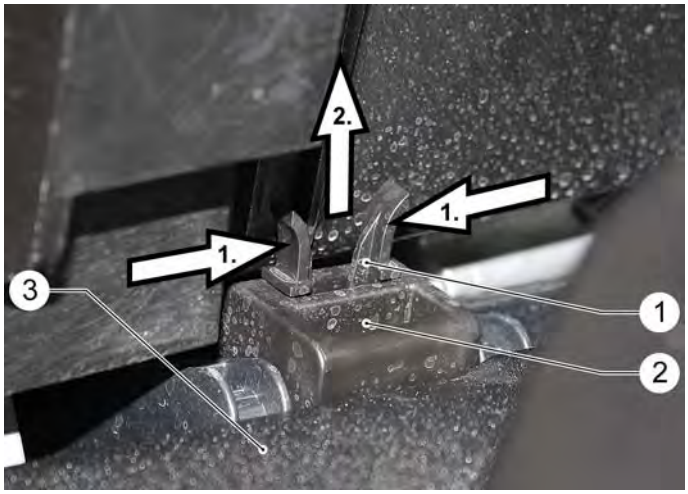
1 Sweeping track, rear brush
2 Sweeping track, front brush
➔ Check the sweeping track of the two brushes. The must run at the same width and parallelly.



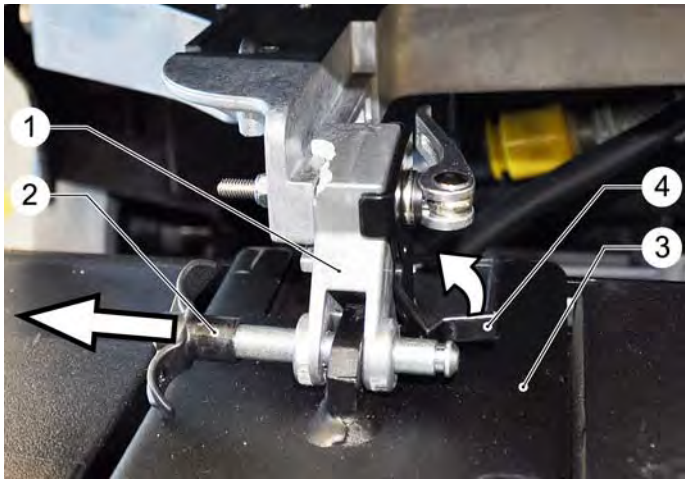
1 Lifter
2 Brush head intake
3 Quick tensioning lever
➔ The setting is adjusted by sliding the brush head intake and the quick tensioning lever.
➔ If the sweeping track is set up correctly, tighten the quick tensioning lever.

6.16 Brush head (BD model)

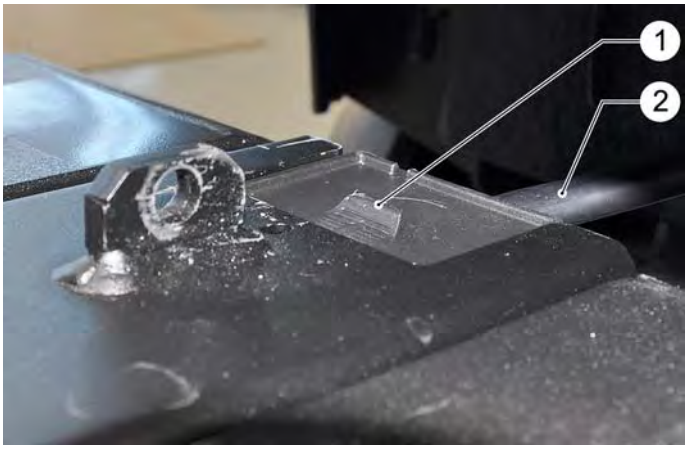
6.16.1Replace the brush head



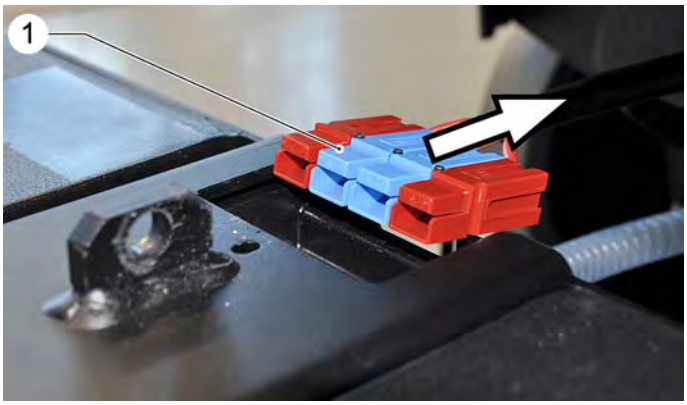
1 Retaining clip
2 Brush head pick up on the push bar
3 Brush head
➔ Switch to "Manual control" with the grey or red key.
➔ Select the brush head.
➔ Lower the brush head by pressing the I button. Check the progress of the lowering.
➔ 1. Compress the holding clamp.
2. Pull the holding clamp all the way up and out.



1 Suspension
2 Brush head
3 Holding pin
4 Lock
➔ Push the lock back slightly and pull out the holding bolt.
➔ Raise the pick-up.



1 Lid, plug for mains connection
2 Connection cable of brush head
➔ Remove the lid of the power connection.



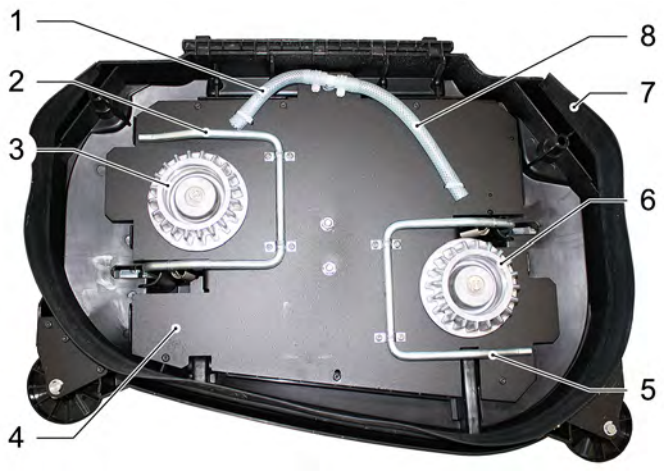
1 Brush head plug
➔ Remove the plug for the power connection.

1 Hose coupling
➔ Disconnect the hose coupling.
➔ Pull the brush head out toward the front.

Sequence of brush head installation:

1. Push the brush head in all the way to the push bar.
2. Insert the fastening clamps into the brush head pick-ups on the push bar.
3. Open the quick tensioning lever on the suspension.
4. Position the brush head under the suspension.
5. Switch to "Manual actuation" with the grey or red key.
6. Select the brush head.
7. Lower the suspension by pressing the I button.
   Check the progress of the lowering and adjust the brush head as needed.
   Lower the suspension enough for the holes on the suspension to be parallel to the pick-up on the brush head.
8. Slide in holding bolt.
   The holding bolt must be able to move easily without pressure.
9. Move the brush head back and forth slightly to remove any tension.
10. Close the quick tensioning lever.

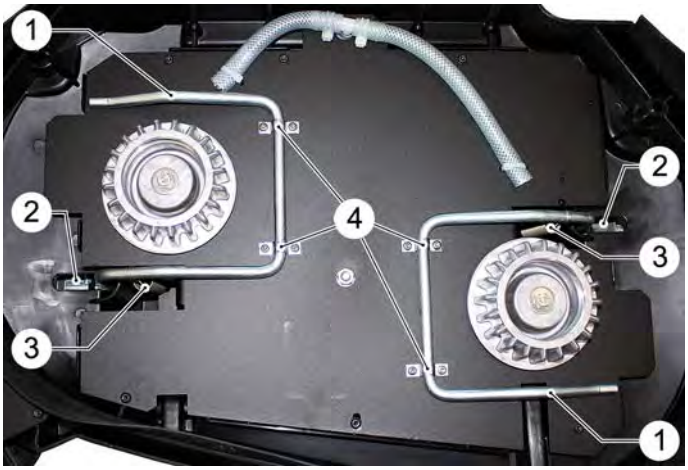
6.16.2Replacing the disc brush pick-up



1 Water distribution hose, left
2 Bow to release the disc brush, left
3 Disc brush pick-up left
4 Floor plate
5 Bow to release the disc brush, right
6 Disc brush pick-up, right
7 Sealing lip
8 Water distribution hose, right

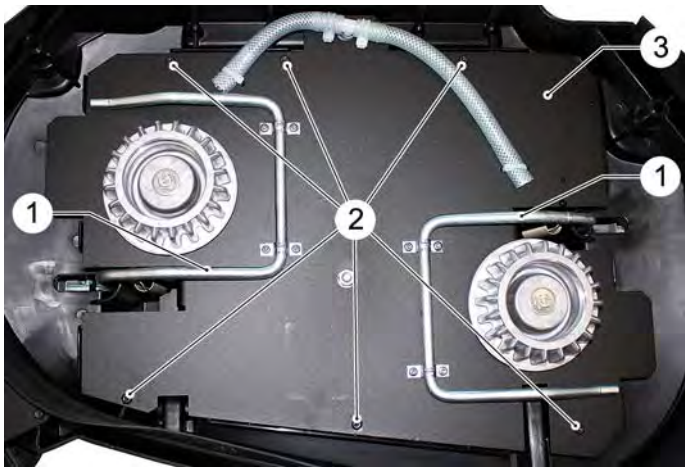
1 Disc brush intake
2 Screw
➔ Loosen the screw.
➔ Remove the disc brush intake.

6.16.3Replace the bow to release the disc brush

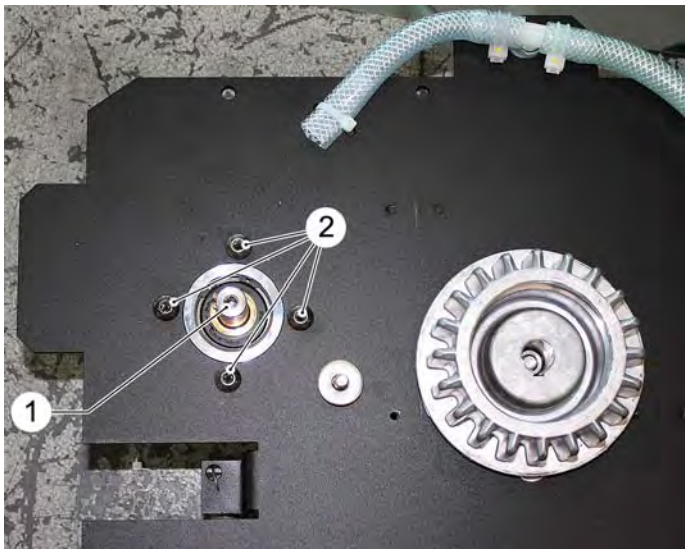


1 Bow to release the disc brush, left
2 Bow guide
3 Spring
4 Bow holder
➔ Unscrew the screws on the holders.
➔ Unhook the springs.
➔ Remove the bow through the guides.

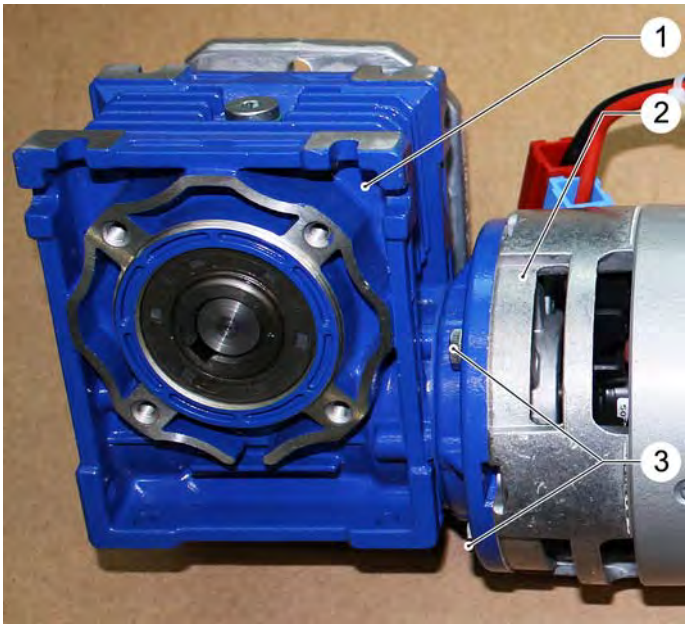
6.16.4Removing the motor with gear



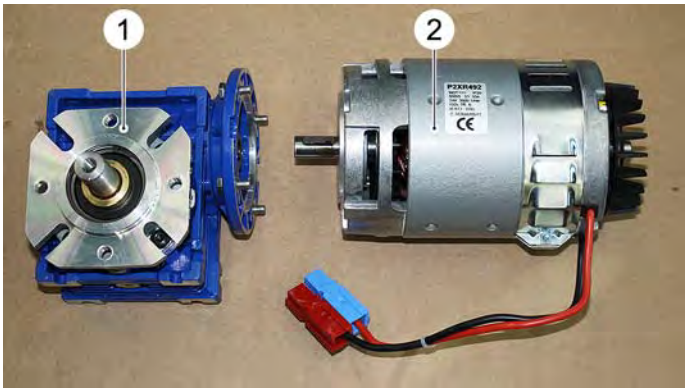
1 Bow to release the disc brush
2 Screws
3 Floor plate
➔ Unscrew the screws.
➔ Remove the floor plate.
➔ Remove the disc brush pick-up.



1 Gear axle
2 Screws
➔ Unscrew the screws.
➔ Remove the gear with motor.

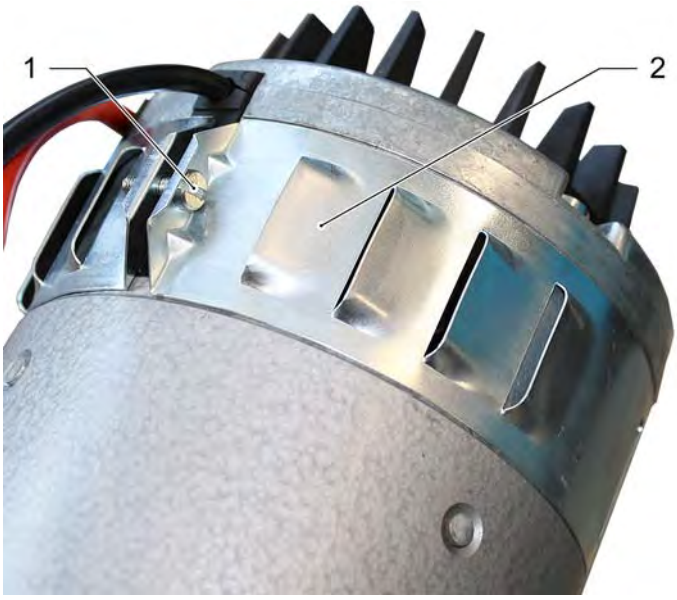


1 Gear
2 Motor
3 Screws
➔ Unscrew the screws.



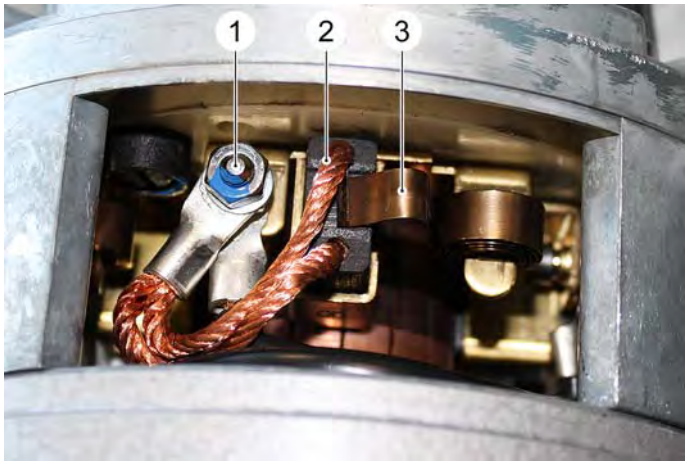
1 Gear
2 Motor

6.16.5Replace the glide contacts on the brush motor

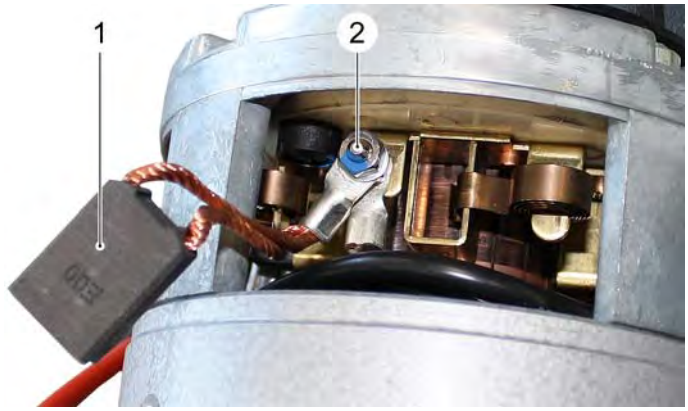


1 Screw
2 Cover, glide contacts

➔ Remove the brush motor.
➔ Loosen screws.
➔ Remove the cover of the glide contacts.

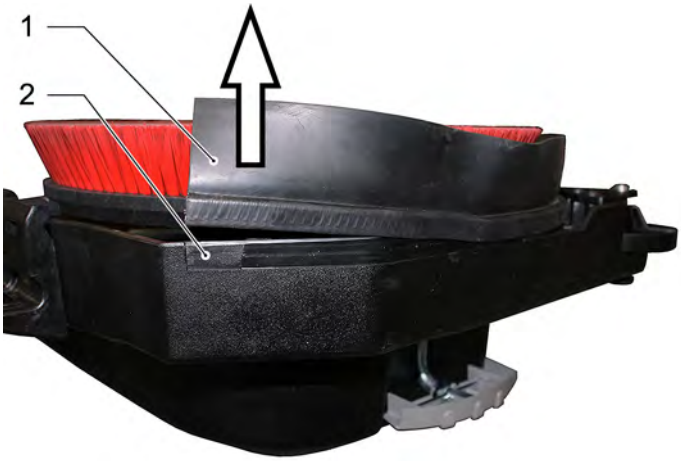


1 Nut, glide contact
2 Glide contact
3 Press spring
➔ Lift the contact spring and pull the glide contact out of the chute.
➔ Carefully place the contact spring onto the chute.



1 Glide contact
2 Nut, glide contact
➔ Unscrew the nut and replace the glide contact.
➔ Perform this procedure on both glide contacts.

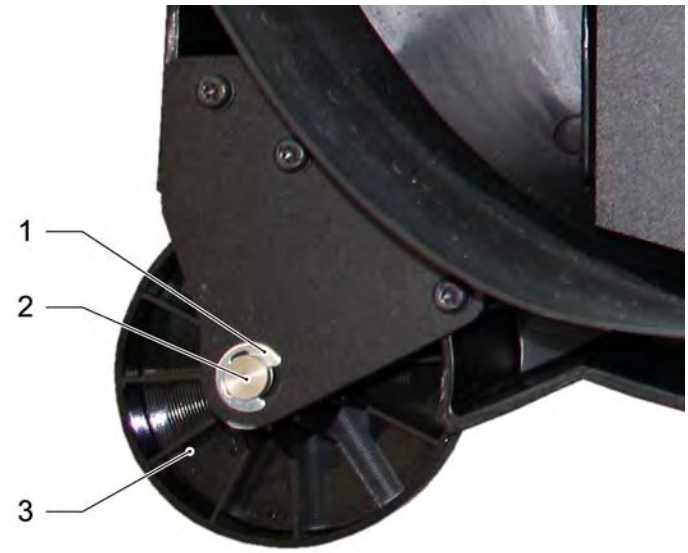
6.16.6Replace the sealing lip



1 Sealing lip
2 Edge trim

➔ Remove the sealing lip from the edge trim.

6.16.7Replacing the deflector roller



1 Safety ring
2 Axis pins
3 Scraper roller

➔ Remove the safety ring.

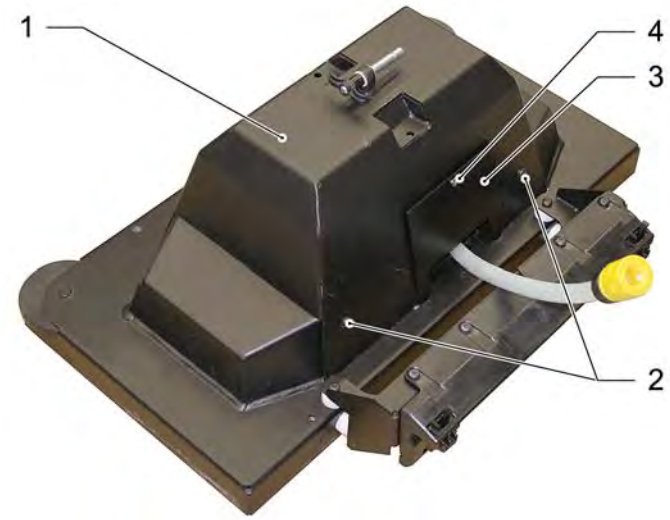
➔ Take the pivot pin out of the holder.

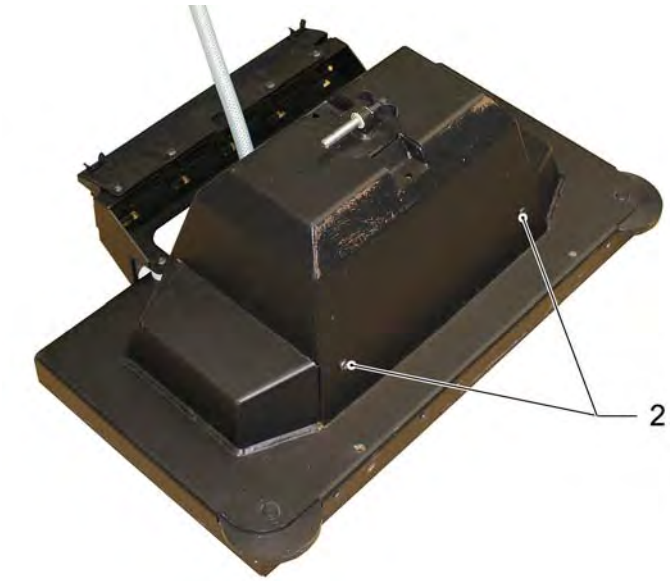
6.17 Brush head S 65 (Swing)

6.17.1Replace the brush head

The replacement takes place just like with the brush head BR model.

6.17.2Remove the housing lid.

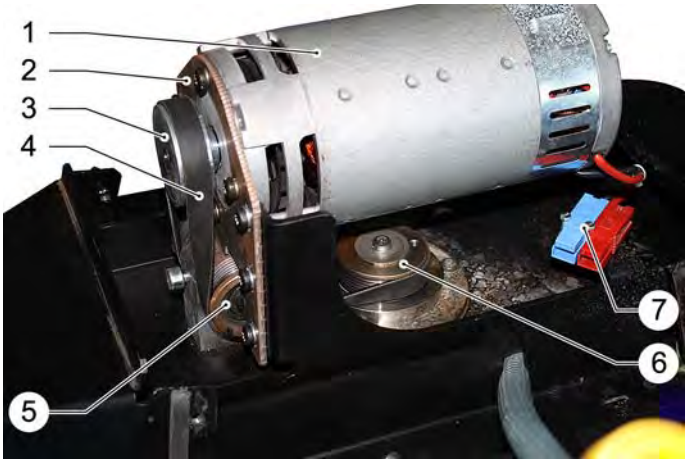




1 Covering lid
2 Screws
3 Lid, plug for mains connection
4 Screw

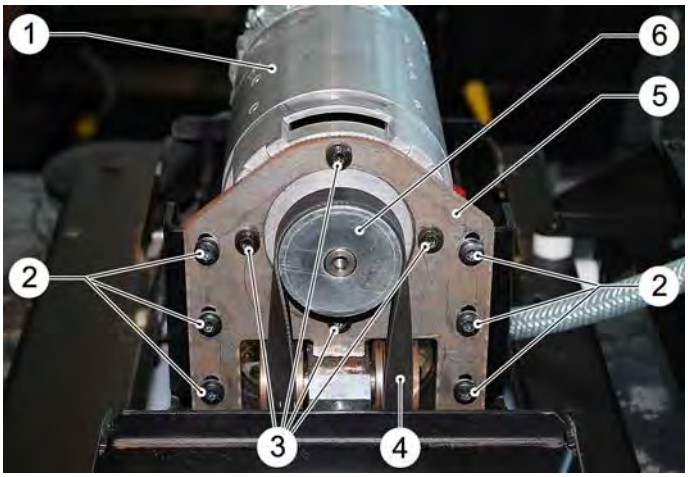
➔ Unscrew the screws.

➔ Remove the housing cover.



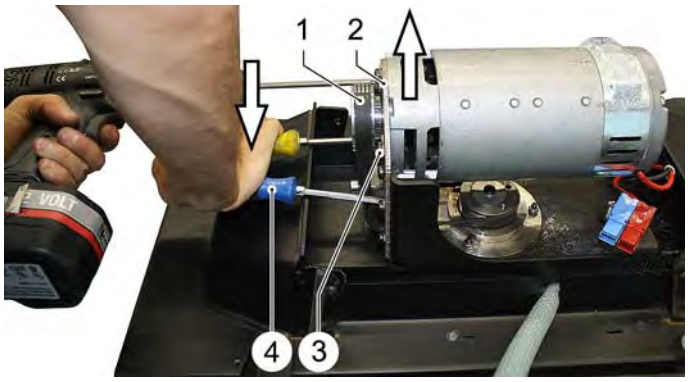
1 Brush motor
2 Motor plate
3 Pulley, drive
4 Drive belt
5 Reversal rollers
6 Pulley, excenter
7 Power connector plug

6.17.3Replace the drive belt



1 Brush motor
2 Motor plate screws
3 Screws, brush motor
4 Drive belt
5 Motor plate
6 Pulley, drive

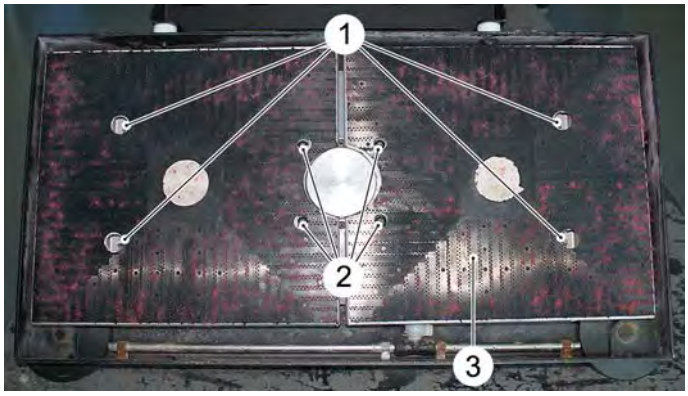
➔ Remove the casing lid.
➔ Loosen the screws on the motor.
➔ Remove the drive belt.
➔ Install a new drive belt.



1 Drive belt
2 Motor plate
3 Motor plate screws
4 Screwdriver

➔ Lift the motor plate up with two screwdrivers and tension the drive belt.
➔ Loosen the screws on the motor plate.

6.17.4Replace deflection pulleys

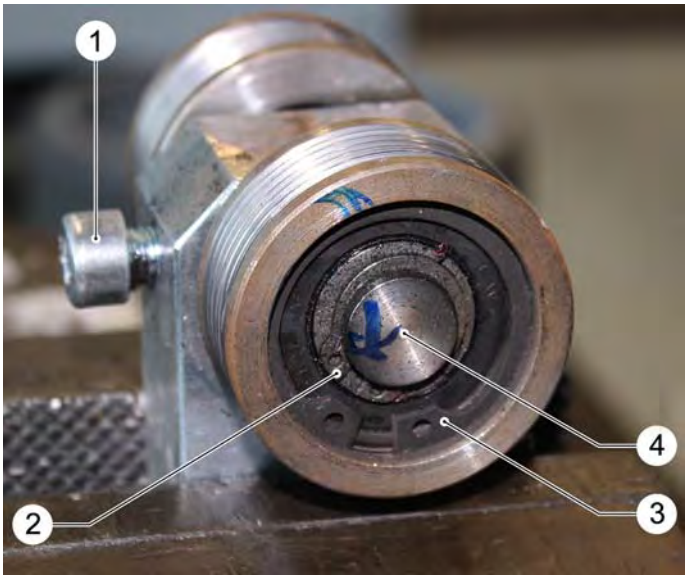


1 Nuts, pad pick-up
2 Screws, pad pick-up
3 Pad pick-up

➔ Remove the casing lid.
➔ Remove the drive belt.
➔ Loosen the mounting nuts.
➔ Unscrew the screws.
➔ Remove the pad pick-up.

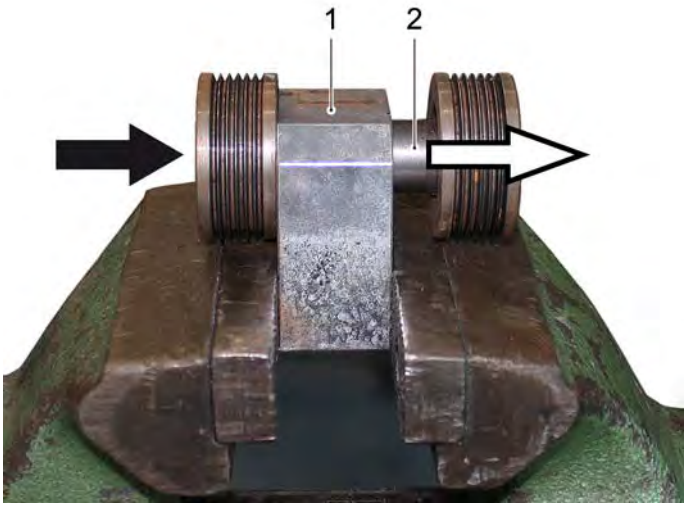
1 Screws, base

➔ Unscrew the screws.
➔ Remove the base with the deflection pulleys.



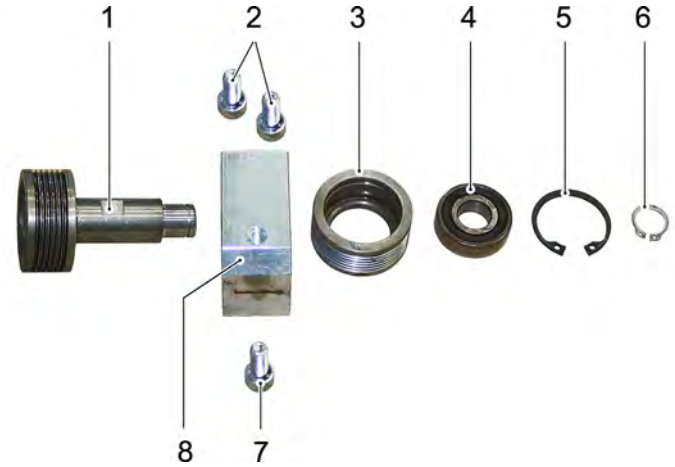
1 Screw, axle mount
2 Safety ring, interior
3 Safety ring, exterior
4 Axle

➔ Remove the interior safety ring.



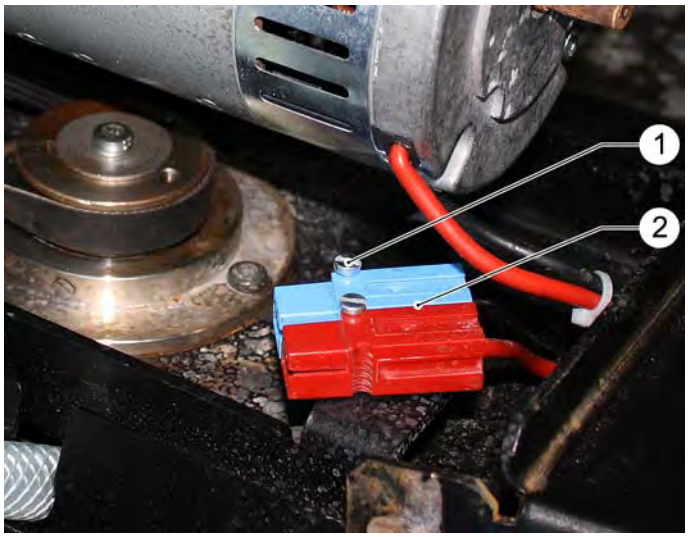
1 Base
2 Axle

➔ Drive the axle out of the base with a driver tool.



1 Axle with deflector pulley
2 Screws
3 Pulley
4 Ball bearing
5 Safety ring, exterior
6 Safety ring, interior
7 Screw, axle mount
8 Base

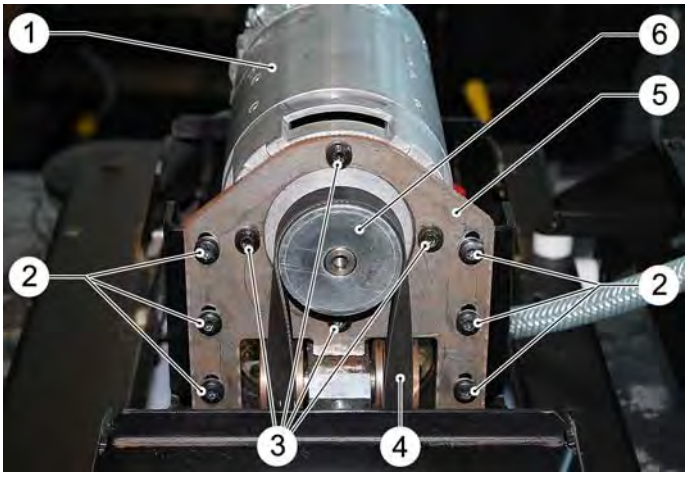
6.17.5Replace the motor.



1 Screw
2 Power connector plug

➔ Remove the casing lid.

➔ Loosen the screw.



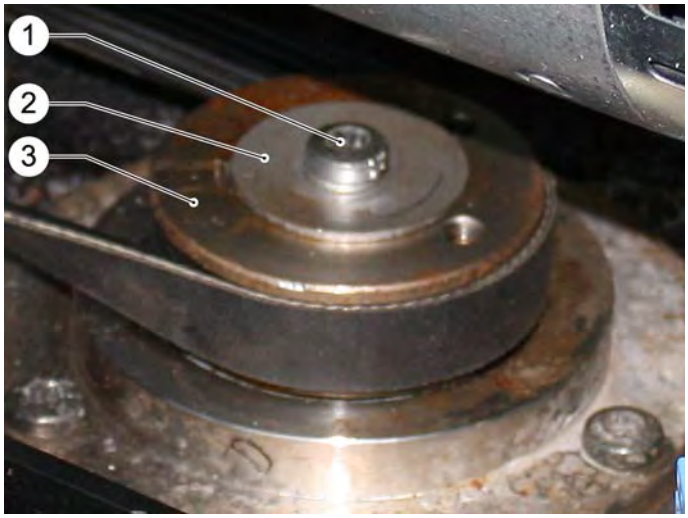
1 Brush motor
2 Motor plate screws
3 Screws, brush motor
4 Drive belt
5 Motor plate
6 Pulley, drive

➔ Loosen the screws on the motor.
➔ Remove the drive belt.
➔ Unscrew the screws of the motor.
➔ Remove the motor.

6.17.6Replace the glide contacts on the brush motor

The replacement takes place just like with the brush head BR model.

6.17.7Replacing the pulley on the excenter



1 Screw
2 Disc
3 Pulley

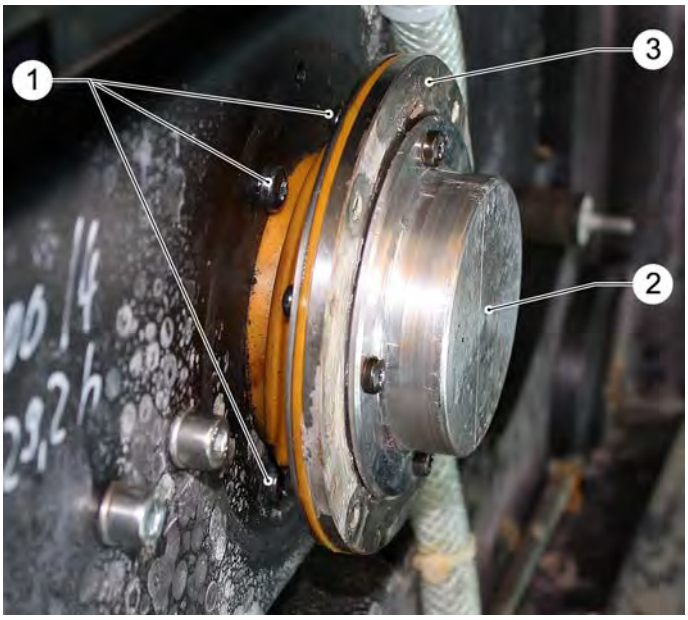
➔ Remove the motor.
➔ Loosen the screw.

Sample picture, excenter removed

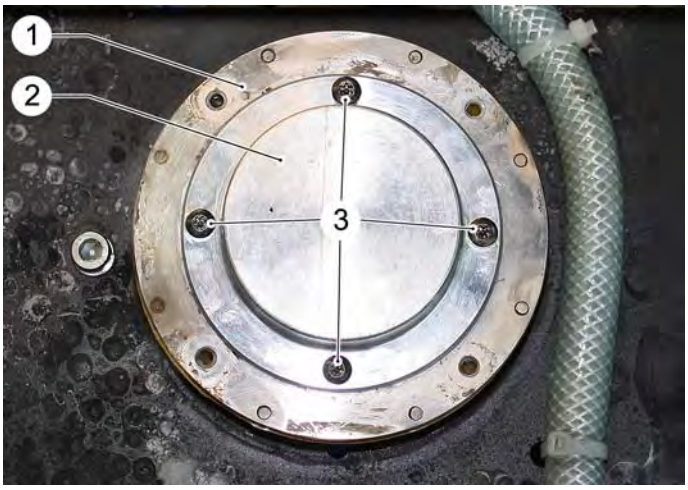
1 Puller tool
2 Screw
3 Pulley

➔ Screw the screw into the pulley.
➔ Attach the puller tool and remove the pulley.

6.17.8Replacing the excenter

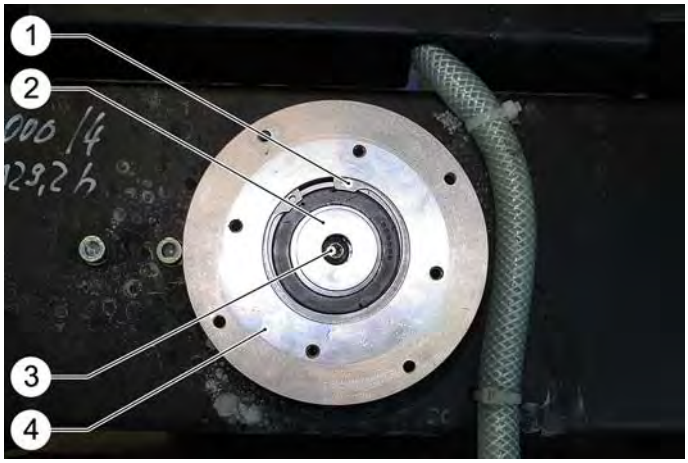


1 Excenter screws
2 Carrier lid
3 Excenter disc with rubber collar



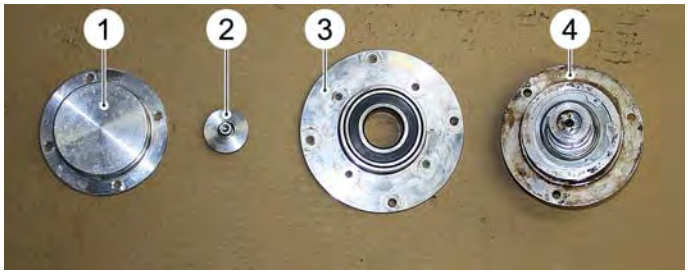
1 Excenter disc with rubber collar
2 Carrier lid
3 Screws

➔ Remove the casing lid.
➔ Remove the drive belt.
➔ Remove the pad pick-up.
➔ Unscrew the screws.
➔ Remove the carrier lid.



1 Safety ring
2 Disc
3 Screw
4 Excenter disc with rubber collar

➔ Loosen the screw.
➔ Remove the excenter disc.
➔ Unscrew the excenter screws.
➔ Remove the excenter from the brush head.



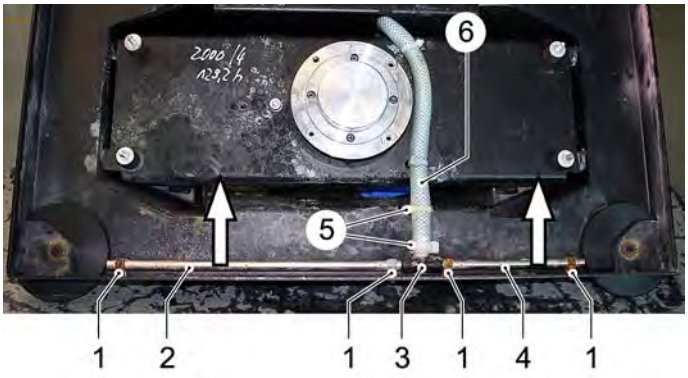
1 Carrier lid
2 Screw with disc
3 Excenter disc with rubber collar
4 Excenter with pulley

1 Rubber collar

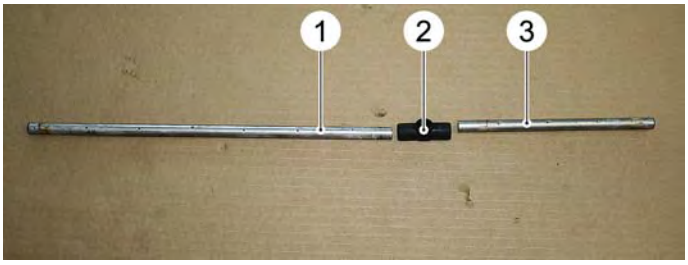
Excenter setup

1 Excenter axis
2 Seal disc
3 Ball bearing
4 Spacer ring
5 Pulley
6 Fitting key
7 Excenter sleeve
8 Safety ring

6.17.9Replace water distribution pipes

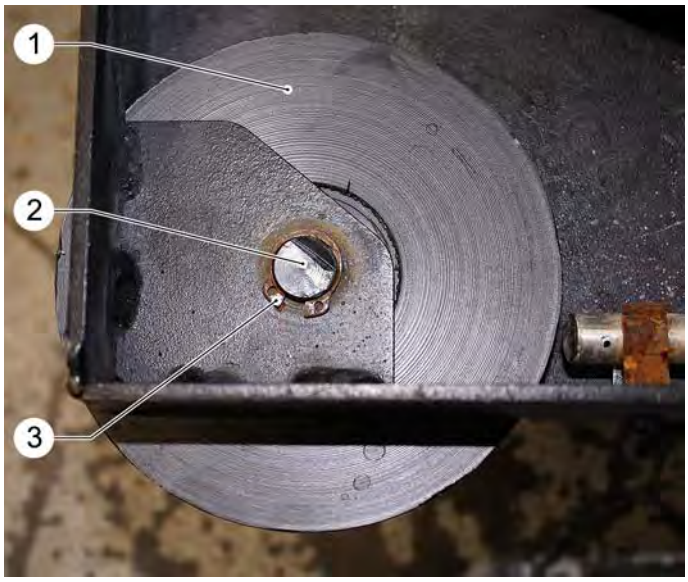


1 Retaining clip
2 Water distributor pipe, left
3 T-piece
4 Water distributor pipe, right
5 Cable connector
➔ Remove the pad pick-up.
➔ Remove the cable ties.
➔ Pull water distribution pipes off of the holding clamps.



1 Water distributor pipe, left
2 T-piece
3 Water distributor pipe, right

6.17.10Replacing the deflector roller

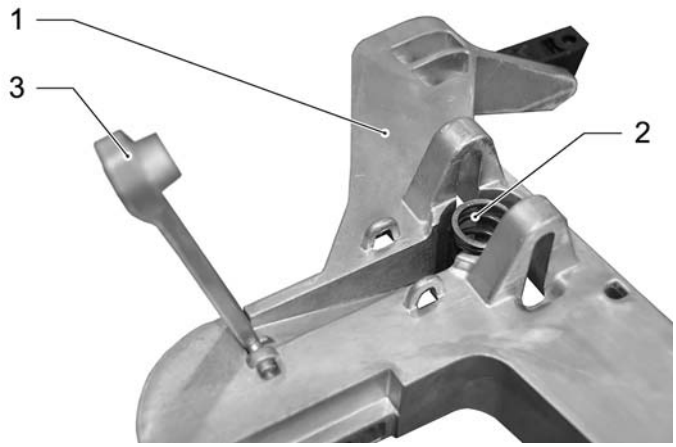


1 Scraper roller
2 Axis pins
3 Safety ring
➔ Remove the pad pick-up.
➔ Remove the axle bolt.
➔ Remove the scraper roller.

6.18 Brush head suspension

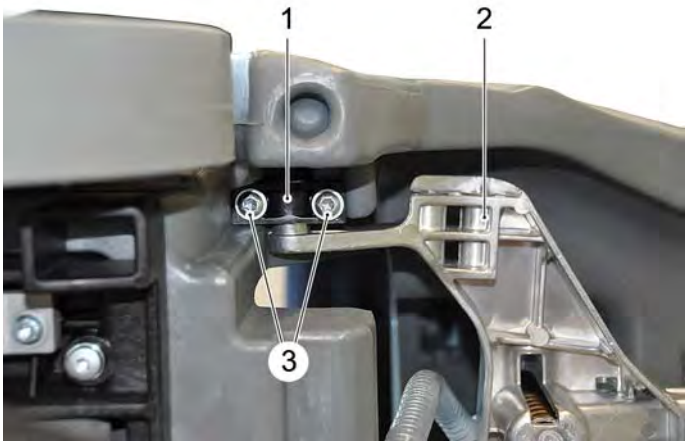
6.18.1Overview of lifter

1 Support right
2 Pick-up, lifting motor
3 Lifter
4 Support left
5 Brush head pick-up
6 Quick tensioning lever
7 Brush head adjustment



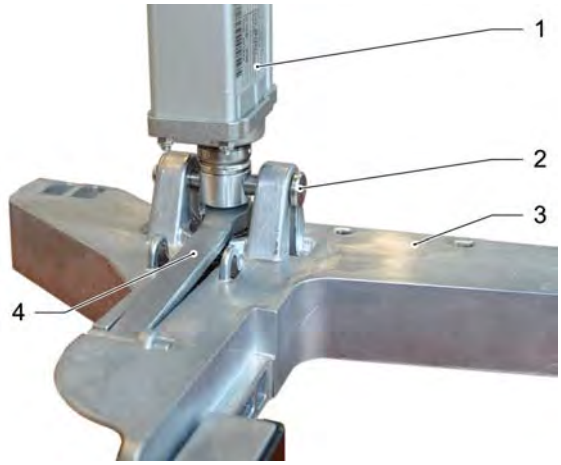
1 Lifter
2 Spring
3 Damping lever

6.18.2Removing the lifter



1 Support
2 Lifter
3 Screws

➔ Remove the brush head.
➔ Unscrew the screws and remove the holder.



1 Lifting motor brush head
2 Bolts
3 Lifter
4 Damping lever

➔ Remove the safety ring from the bolt.
➔ Pull out the bolt.
➔ Remove the lifter.

6.18.3Adjust the quick tensioning lever on the lifter

1 Quick tensioning lever
2 Tension nut
3 Brush head intake

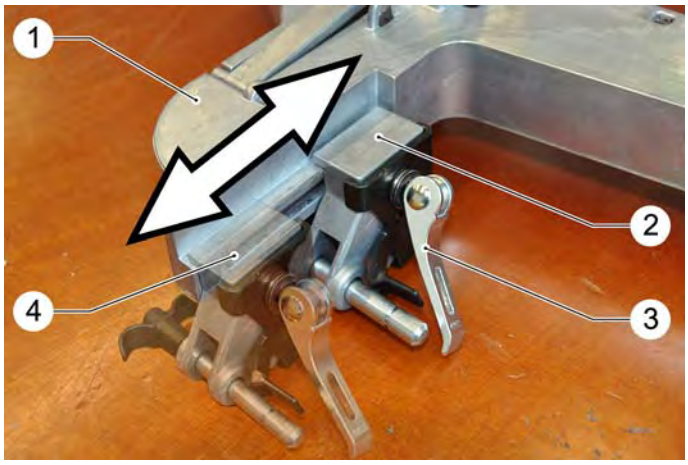
➔ Close the quick tensioning lever.
➔ Tighten the tension nut to 6 Nm.

Caution

The quick tensioning lever must be closed tightly and resting on the end stop.
If the device is operated with a loose quick tensioning lever the brush head pick-up can break.

6.18.4Adjust the brush head pick-up on the lifter

To attach different brush heads, the brush head pick-up must be adjusted according to the pick-up points on the brush head.



1 Lifter
2 Rear brush head pick-up
3 Quick tensioning lever
4 Front brush head pick-up

➔ Open the quick tensioning lever.
➔ Move the brush head pick-up:
Front adjustment: BD
Rear adjustment: BR
➔ Close the quick tensioning lever.
Check the brush level, adjust if required.

6.19 Lifting motors

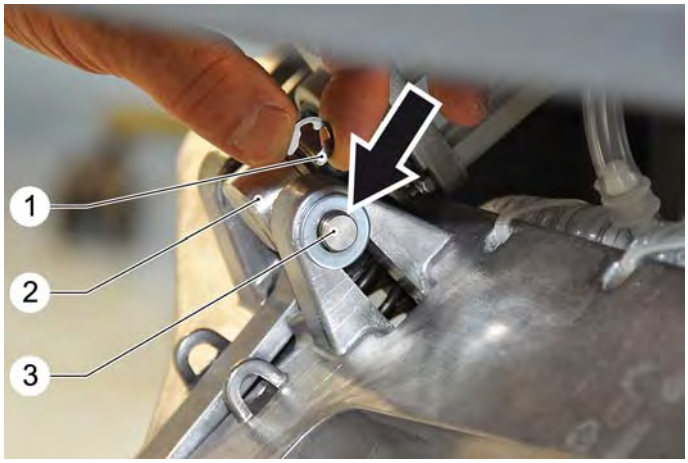
6.19.1 Replacing the lifting motor of the brush head

1 Holder of upper pick-up
2 Lifting motor brush head
3 Bottom pick-up on lifter
➔ Remove the brush head.
➔ Lower the lifter.
➔ Hold the wastewater reservoir by the handle recess and swivel the reservoir upwards toward the side.
➔ Remove the holder of the upper pick-up.

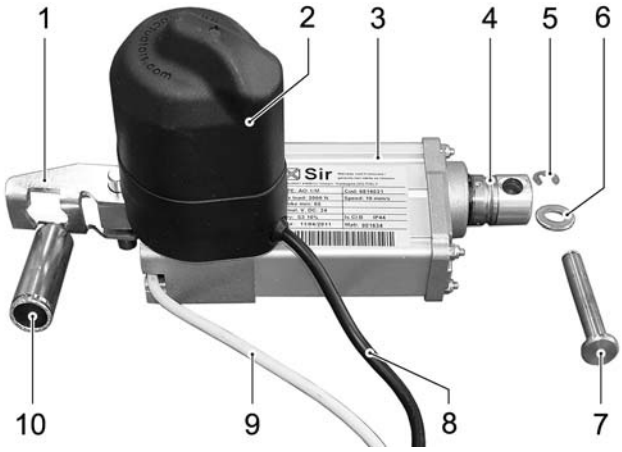
1 Sleeve
➔ Remove the sleeve.

Caution

Hold the lifting motor so it does not drop.



1 Safety ring
2 Spindle head, lifting motor
3 Bolts
➔ Remove the safety ring.
➔ Pull out the bolt.
➔ Disconnect the connecting cable.
➔ Remove the lifting motor.



1 Upper mount
2 Motor
3 Spindle casing
4 Spindles
5 Safety ring
6 Disc
7 Bolts
8 Connecting cable, motor
9 Signal cable end switch
10 Sleeve

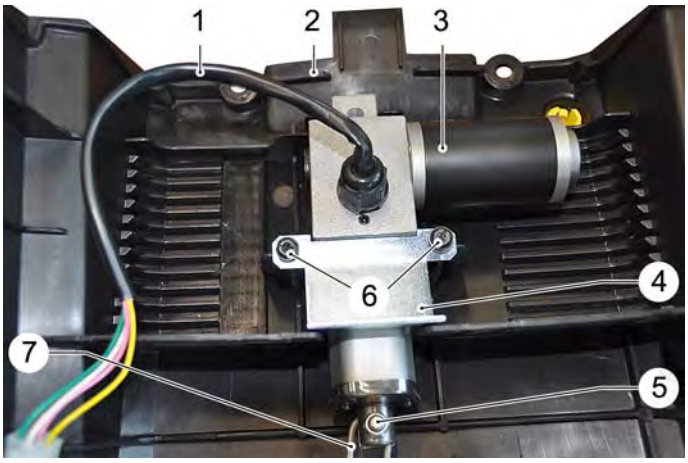
Note

The lifting motor is controlled via a micro switch. The micro switch is not adjustable.
The micro switch shuts off the lifting motor in its upper position. The bottom position is electronically controlled via the two brush motors.

6.19.2 Replacing the lifting motor of the vacuum barpick

1 Lifting motor connecting cable
2 Rear cover
3 Motor

➔ Open the rear cover.
➔ Remove the connecting cable from the support plate of the control electronics.



1 Lifting motor connecting cable
2 Rear cover
3 Motor
4 Halting plate
5 Bolts with nuts
6 Screws
7 Coil Chain

➔ Unscrew the nut on the bolt.
➔ Remove the bolt.
➔ Loosen screws.
➔ Remove the holding plate.
➔ Remove the lifting motor.

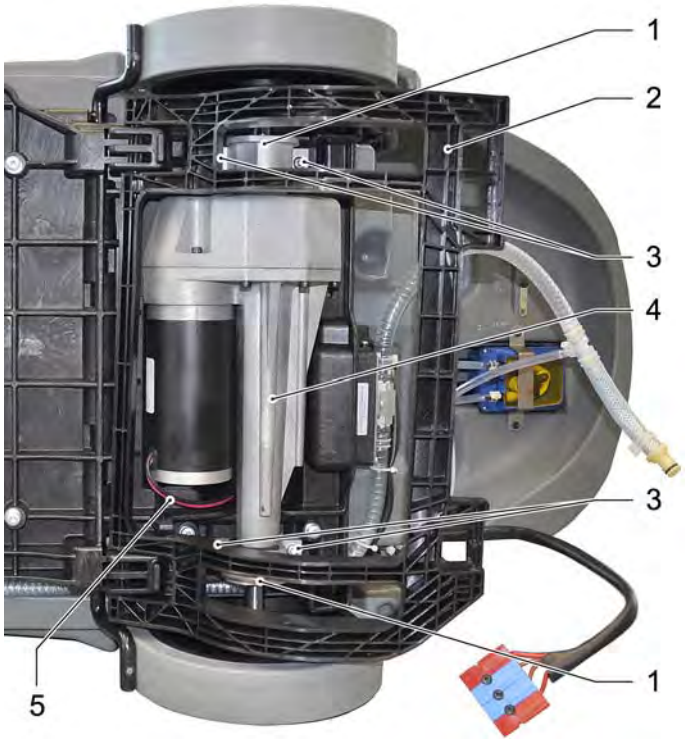
Note

The lifting motor is controlled via two micro switches. The micro switches are not adjustable.
One micro switch shuts off the lifting motor in its upper position, the second one in the bottom position.

6.20 Drive and wheels

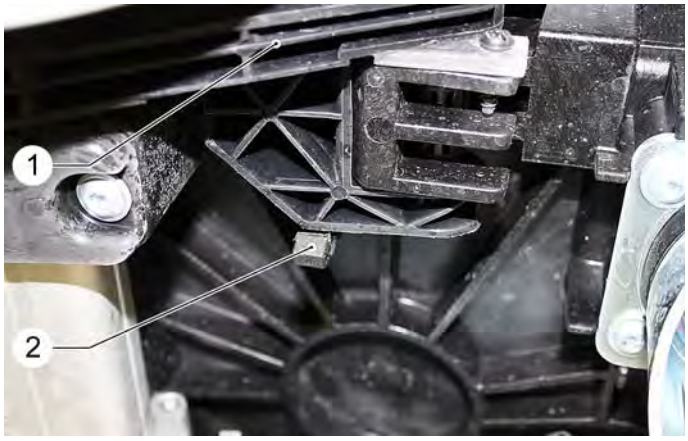
6.20.1 Replace the drive motor with gear axle

The drive motor and the gear axle can only be replaced as one unit if they are defective.



1 Holder, gear axle
2 Push rod, brush head
3 Screws
4 Gear axle with drive motor
5 Connection cable, drive motor

➔ Remove the brush head.
➔ Remove the batteries.
➔ Tilt the appliance to the side and rest it.
➔ Unscrew the screws and remove the holder.



1 Push rod, brush head
2 Lock hook

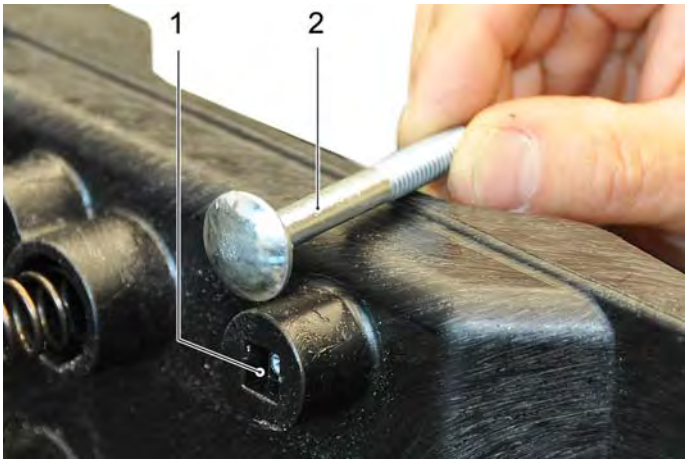
➔ Press the hook on the push rod slightly toward the middle of the appliance until the push rod can be pivoted toward the bottom.
➔ Press the push rod all the way down.
➔ Unscrew the screws.
➔ Remove the holder.

➔ Remove the gear axle with drive motor toward the bottom.
➔ Remove the connecting cable on the control electronics.

Repair solution
Steering roller mount / drive motor mount

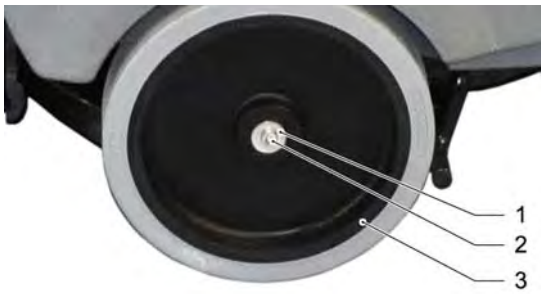
1 Steering roller mount

If you should not be able to mount from the bottom anymore, you can install long M8 carriage bolts from the top.

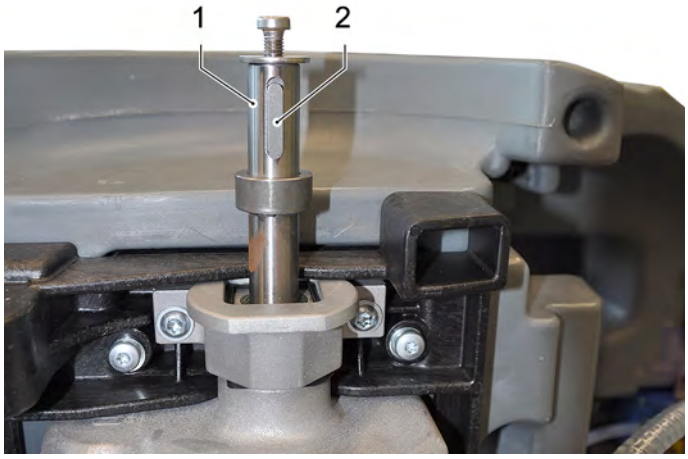


1 Holes
2 Lock screw M8
➔ In this case, drill the bores to 8.5 mm.
➔ Insert the lock screw into the hole from above.
➔ Install the steering roller/drive motor and fasten them from the bottom with self-locking hex nuts.

6.20.2Replace the wheel



1 Washer
2 Screw
3 Wheel
➔ Loosen the screw.
➔ Pull the wheel off the axle.



1 Axle stub
2 Fitting key
➔ Install the new wheel onto the greased axle stub.

Note

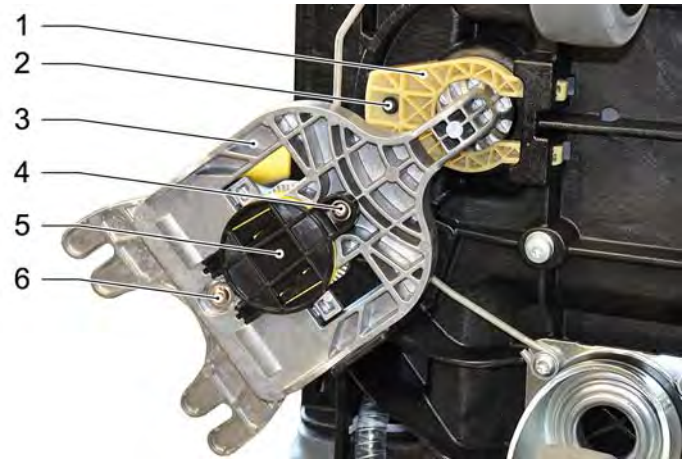
Pay attention to the installation position of the wheel! The shorter part of the wheel hub is located on the outside.

6.20.3Replacing the steering roller

1 Screws
2 Steering roller
➔ Unscrew the screws.
➔ Remove the steering roller and replace it.

6.21 Suction system

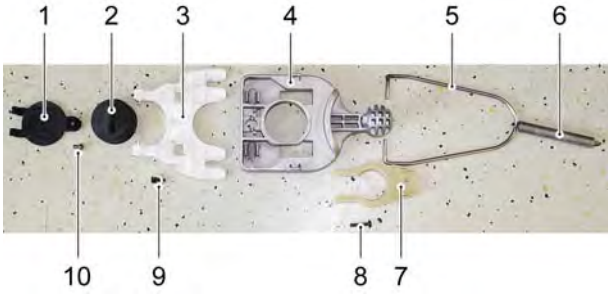
6.21.1Replace the vacuum bar suspension



1 Holder, vacuum bar suspension holder
2 Screw, vacuum bar suspension holder
3 Vacuum bar suspension
4 Screw on the rotary handle.
5 Rotary handle to incline the vacuum bar
6 Screw on the rotary handle with washer

➔ Unscrew the screw from the holder.
➔ Remove the vacuum bar suspension with holder.
➔ Unscrew both screws on the rotary handle and disassemble the vacuum bar suspension.

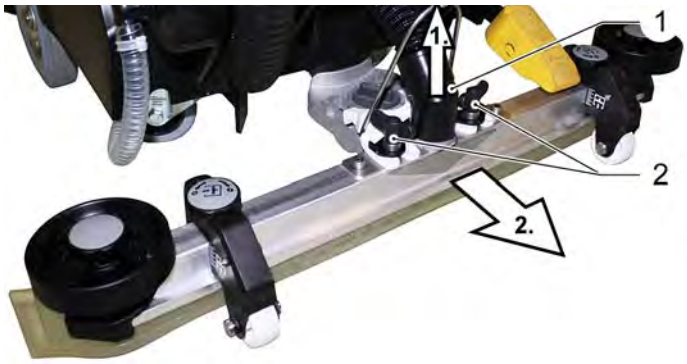
When disassembling the vacuum bar suspension make sure you will remember how to reassemble them. This will facilitate the assembly process.



1 Rotary handle, bottom
2 Rotary handle, top
3 Vacuum bar pick-up
4 Vacuum bar suspension
5 Bow
6 Spring
7 Holder, vacuum bar suspension holder
8 Screw, vacuum bar suspension holder
9 Screw on the rotary handle with washer
10 Screw on the rotary handle.

➔ Replace defective parts.

6.21.2Replace the vacuum bar.



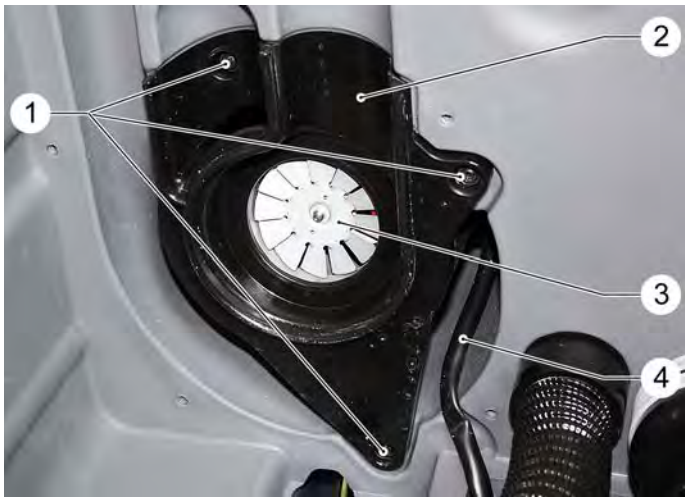
1 Suction hose
2 Wing screws of suction bar support

➔ Pull out the suction hose from the vacuum bar.
➔ Loosen the wingscrews of the vacuum bar suspension and pull the vacuum bar out of the intake.

6.21.3Replacing the suction turbine

1 Suction channel cover
2 Screws

➔ Hold the wastewater reservoir by the handle recess and swivel the reservoir upwards toward the side.
➔ Unscrew the screws.



1 Screws
2 Holder, suction turbine
3 Suction turbine
4 Connecting cable, suction turbine

➔ Unscrew the screws.
➔ Remove the holder with the suction turbine and separate the holder from the suction turbine.

1 Connecting cable, suction turbine

➔ Remove the connecting cable.

➔ Replace the suction turbine.

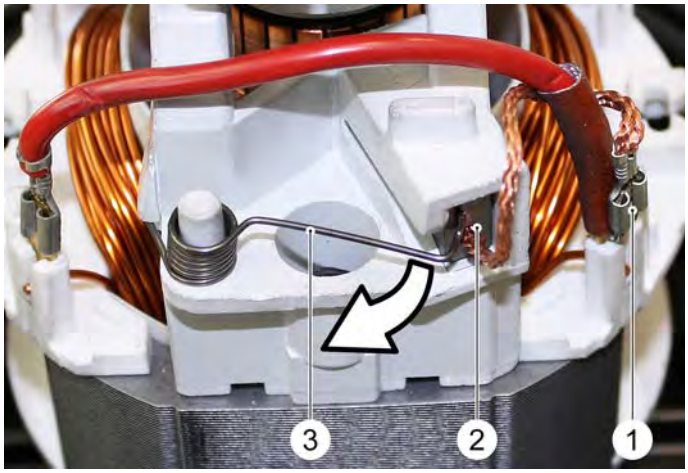
Note

If the suction turbine is damaged by water entering, the float in the wastewater reservoir cover must be checked for its functionality.

6.21.4 Replacing the glide contacts of the suction turbine

1 Cover cap, glide contact

➔ Pull out the cover cap from the suction turbine toward the top.

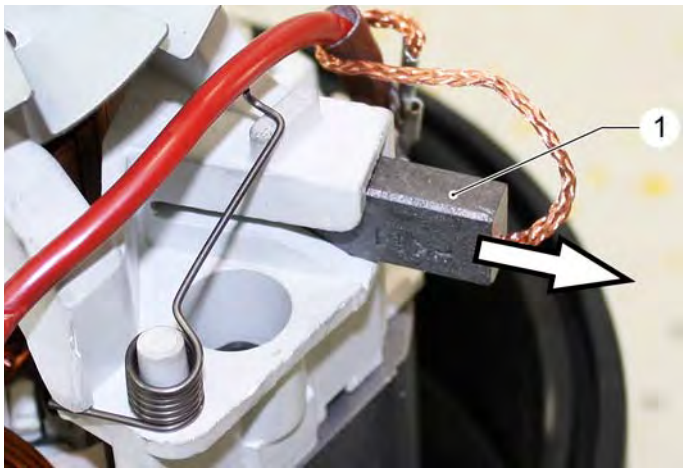


1 Connection plug, glide contact

2 Glide contact

3 Press spring

➔ Lift the contact spring.



1 Glide contact

➔ Pull the glide contact out of the chute.

➔ Carefully place the contact spring onto the chute.

➔ Pull out the connecting plug.

➔ Perform this procedure on both glide contacts.

6.22 Control electronics/charger

6.22.1Open the control electronics

The control electronics must be opened to perform voltage measurements.

Caution

Risk of destruction by electrostatic discharge (ESD)! The following measures must be taken prior to working on electronic components to avoid damages:

- *Wear ESD shoes.*
- *Touch one of the battery terminals with your hand for equipotential.*
- *Do not remove the electronics from their packaging until you are ready to start the installation.*

Note

The factory settings must be loaded prior to replacing the control or the charger.
Please check the device as to whether this measure has solved the fault.

➔ Disconnect the battery for 1 minute and then reconnect the battery (reset).
➔ Check battery voltage under load.
➔ Check the voltage input to the control electronics under load.
➔ Transfer the current software to the control electronics and the control panel board.

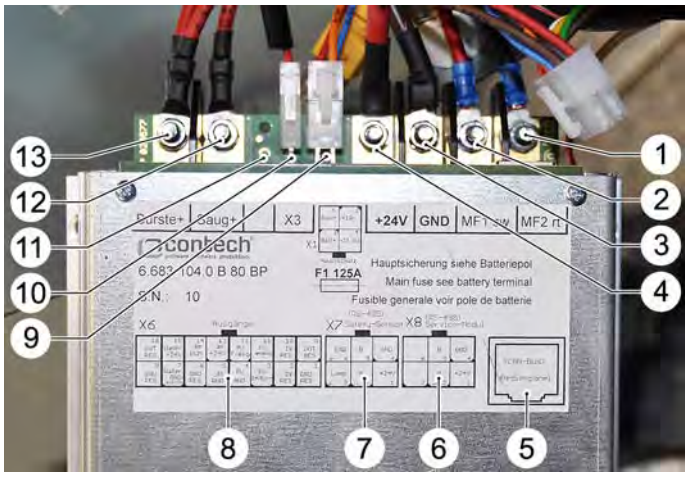
Note

After replacing the control, you must set up the correct battery type in the battery menu; otherwise, the battery may be damaged!
The charge parameters are derived from the set up battery type and are only present in the control and not in the charger.
Check the language and the brush head used and adjust if necessary.

1 Screw
2 Support plate, control electronics

➔ Remove rear appliance cover.
➔ Unscrew the screw and open the support plate toward the bottom.

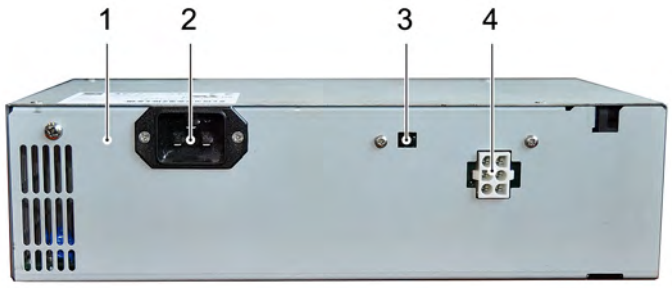
1 Charger
2 Connecting cable for charger
3 Control electronics
4 Connection cable lifting motor vacuum bar
5 Support plate, control electronics



Terminals of the control electronics

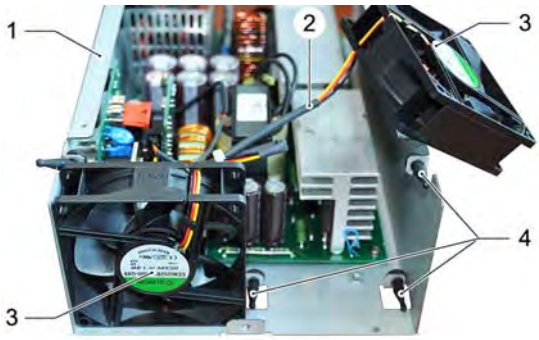
1 Terminal MF2 rt, drive motor
2 Terminal MF1 sw, drive motor
3 Connection (GND)
4 Connection +24V
5 Connection CAN-BUS operating panel
6 Terminal X8, service module
7 Terminal X7, safety sensor
8 Terminal X6, output
9 Terminal X1
10 Terminal X3
11 Not assigned
12 Terminal vacuum+, suction turbine
13 Terminal brush+, brush motor

6.22.2Charger



1 Charger
2 Connecting cable for charger
3 Terminal data transfer cable (patch cable)
4 Terminal charge cable

6.22.3Replace fan



1 Charger
2 Connecting cable, fan
3 Fan
4 Rubber cone

➔ Remove the top part of the casing.
➔ Pull the ventilators off of the rubber cones.
➔ Pull the connecting cable of the fan off the PCB.

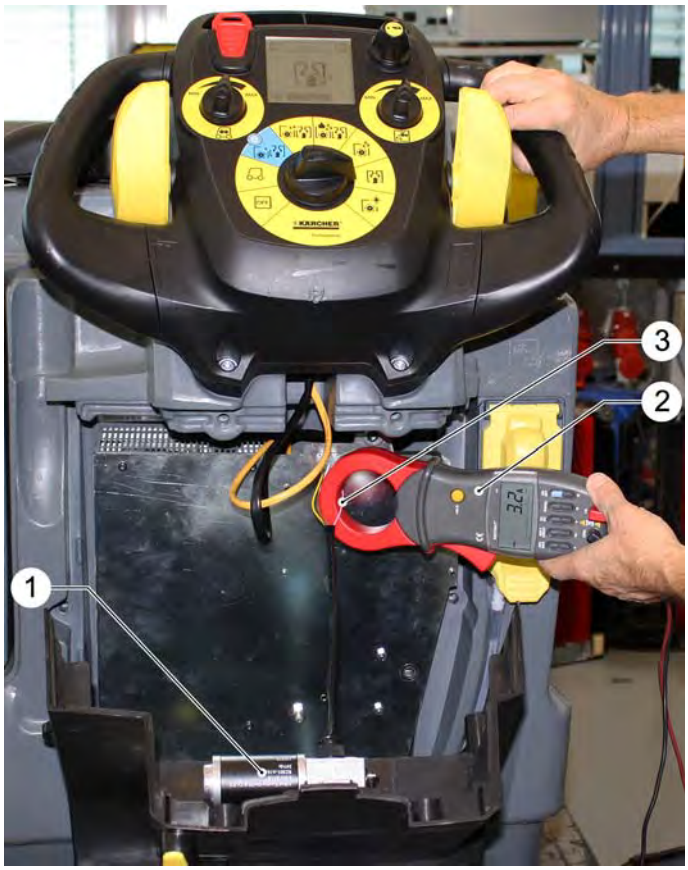
6.22.4Replace the mains cable of charger

1 Cable screw connection
2 Charger
3 Mains cable of charger
4 Support plate

➔ Remove rear appliance cover.
➔ Open the support plate by folding it toward the bottom
➔ Unplug the mains cable from the charger.
➔ Loosen the cable screw connection and remove it from the support plate.

6.23 Electrical measurements

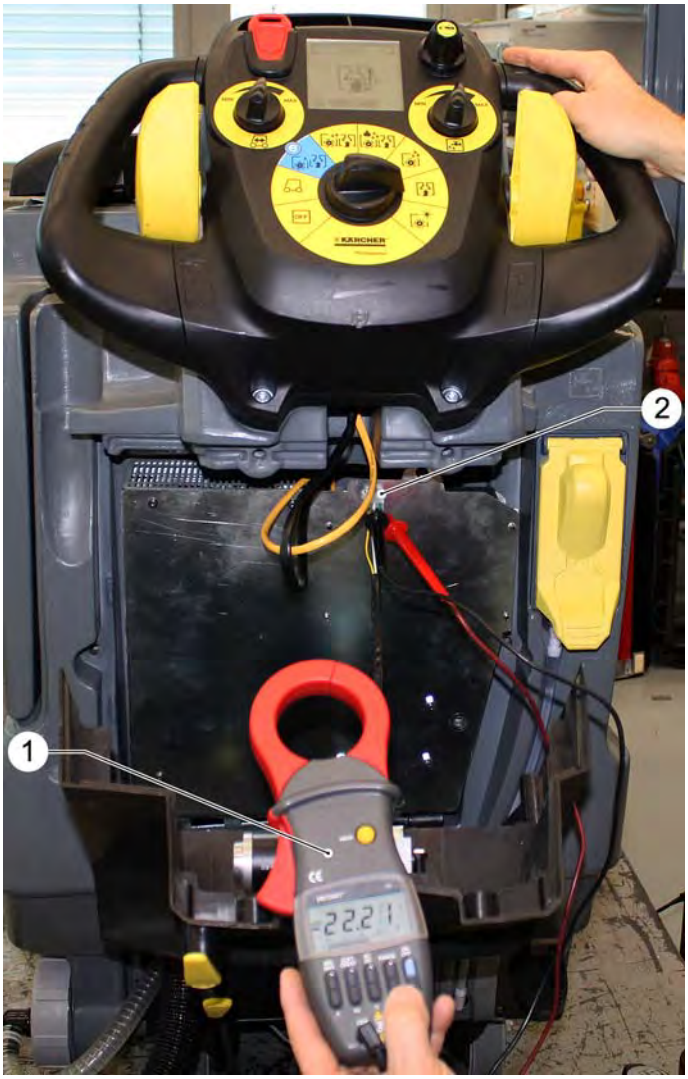
6.23.1Current measurement of lifting motor vacuum bar



1 Lift motor suction bar
2 Measuring device
3 Lifting motor cable

➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the measuring device to the lifting motor cable as shown in the illustration.
➔ Actuate drive lever.
➔ Measure the current.

6.23.2Voltage measurement of lifting motor vacuum bar



1 Voltage measuring device
2 Plug contact lifting motor cable

➔ Plug in the Intelligent Key.

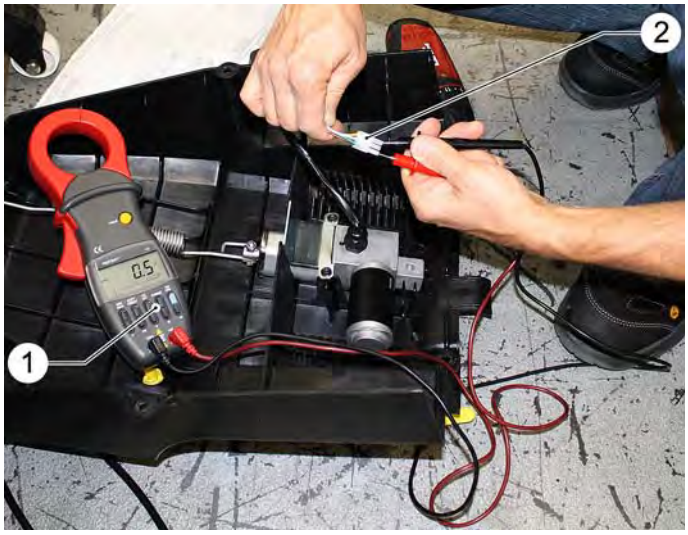
➔ Turn the programme selector switch to the respective programme.

➔ Connect the voltage measuring device to the lifting motor cable plug-in contact as shown in the illustration.

➔ Actuate drive lever.

Display on the voltage measuring unit, approx. battery voltage.

6.23.3Resistance measurement micro switch lifting motor vacuum bar



1 Measuring device
2 Plug for lifting motor cable

Lifting motor retracted:

➔ Connect the measuring probe on the plug-in contact 3 (X9).

➔ Connect the measuring probe on the plug-in contact 7 (X9).

Measured value: 0.5 Ohm

Lifting motor extended:

➔ Connect the measuring probe on the plug-in contact 3 (X9).

➔ Connect the measuring probe on the plug-in contact 2 (X9).

Measured value: 0.5 Ohm

6.23.4Check the charge current

1 Charging cable
2 Measuring device

➔ Connect the charger to the current network.

➔ Connect the measuring device to the charging cable as shown in the illustration.

➔ Measure the current.

The measured value must be max. 35 A.

6.23.5Current pickup of suction turbine

1 Battery cable (+24 Volt)
2 Measuring device
➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the measuring device to the battery cable as shown in the illustration.
➔ Actuate drive lever.
➔ Measure the current.

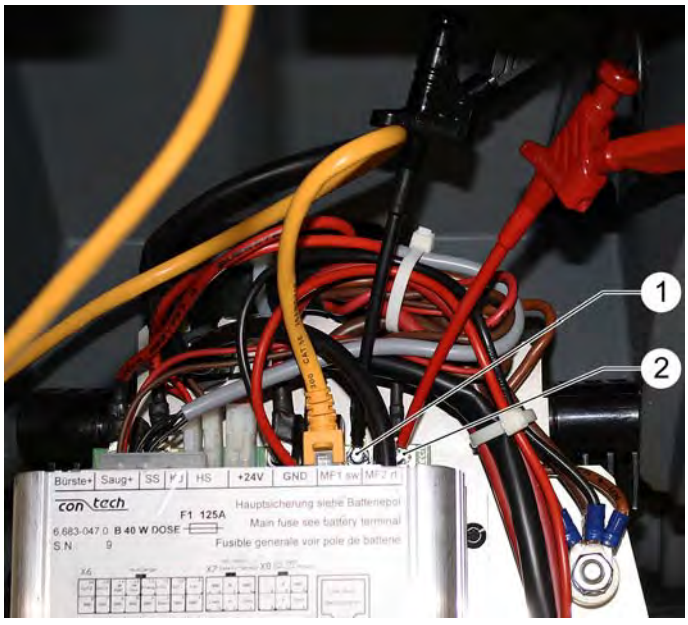
6.23.6Current pick-up of the brush motor

1 Battery cable (+24 Volt)
2 Measuring device
➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the measuring device to the battery cable as shown in the illustration.
➔ Actuate drive lever.
➔ Measure the current.

6.23.7Current pickup:

1 Battery cable (+24 Volt)
2 Measuring device
➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the measuring device to the battery cable as shown in the illustration.
➔ Actuate drive lever.
➔ Measure the current.

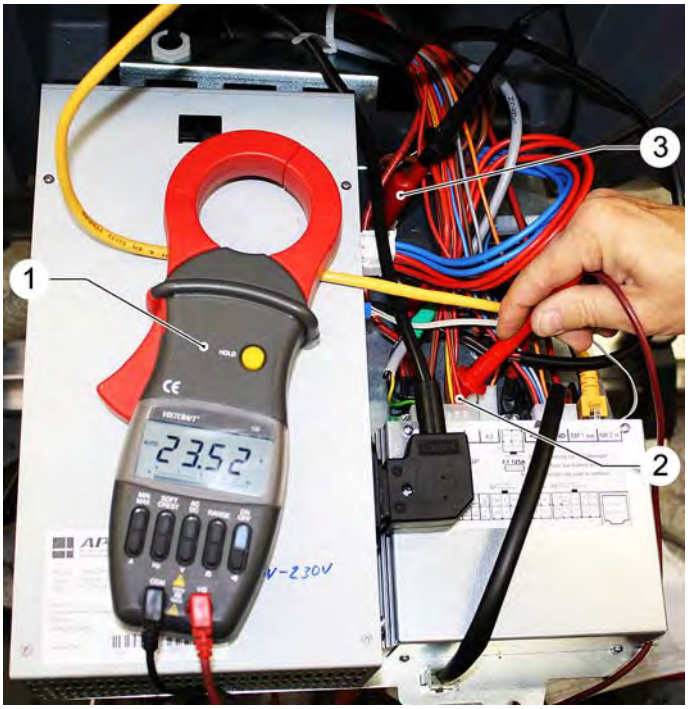
6.23.8Voltage measurement transport drive under full load



1 Voltage measuring device
2 Connection, MF1 sw
3 Connection, MF2 rt
➔ Plug in the Intelligent Key.
➔ Set the programme selector switch to transport mode and wait until the self-test on the operating panel display is completed.

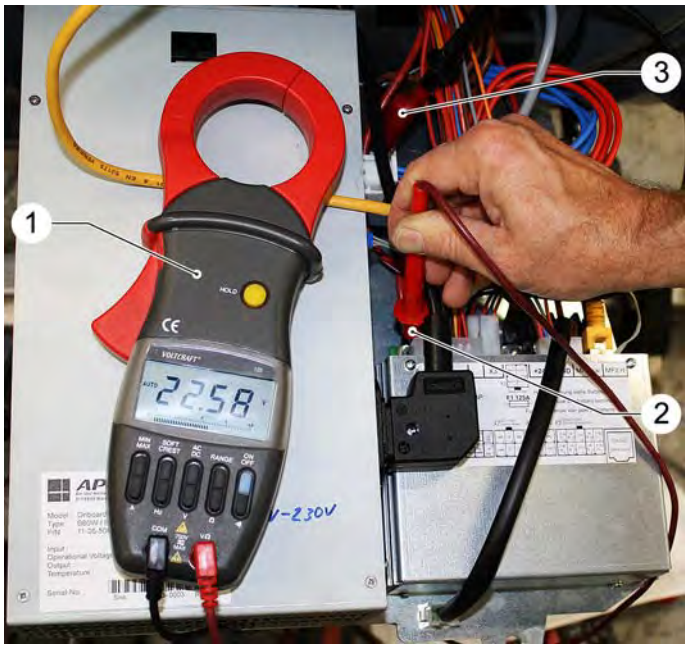
➔ Connect the voltage measuring unit to connections "MF1 sw" and "MF2 rt" as shown in the illustration.
➔ Set the rotary knob for drive speed to "MAX".
➔ Press the driving lever all the way to the stop.
Display on the voltage measuring unit, approx. 20 V.

6.23.9Voltage measurement suction turbine



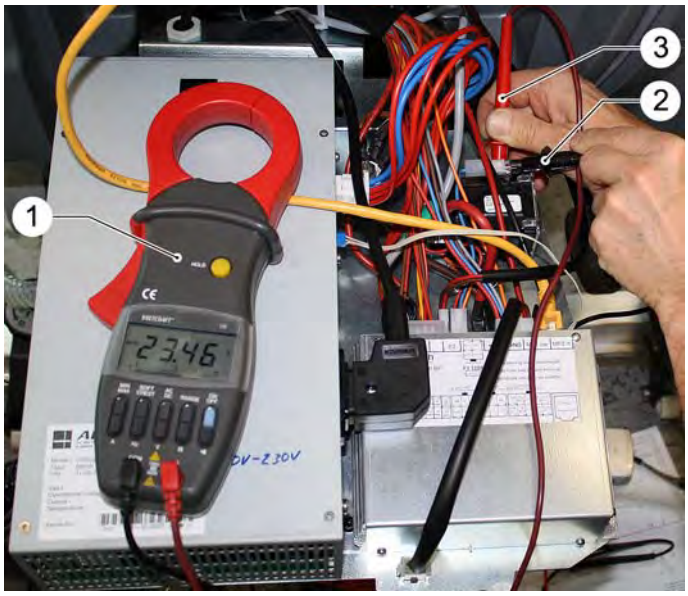
1 Measuring device
2 Measuring probe on the suction+, suction turbine
3 Measuring probe on negative terminal
➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the voltage measuring device as shown in the illustration.
➔ Actuate drive lever.
Display on the voltage measuring unit, approx. battery voltage.

6.23.10Brush motor voltage measurement



1 Measuring device
2 Measuring probe on the connection brush+, brush motor
3 Measuring probe on negative terminal
➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the voltage measuring device as shown in the illustration.
➔ Actuate drive lever.
Display on the voltage measuring unit, approx. battery voltage.

6.23.11Voltage measurement relay

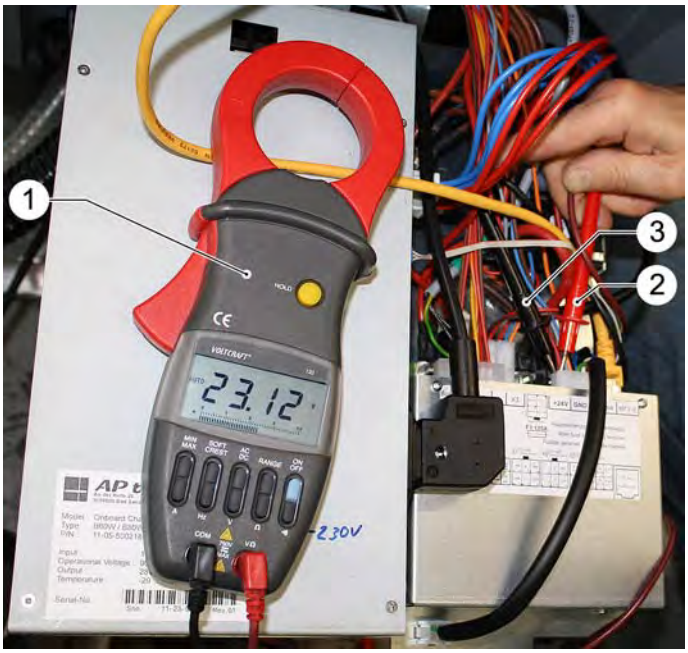


1 Measuring device
2 Measuring probe on the cable plug of the magnetic coil top
3 Measuring probe on the cable plug of the magnetic coil bottom
➔ Plug in the Intelligent Key.

➔ Turn the programme selector switch to transport mode.
➔ Connect the voltage measuring device as shown in the illustration.

Display on the voltage measuring unit, approx. battery voltage.

6.23.12Voltage measurement lifting motor brush head on terminal X9



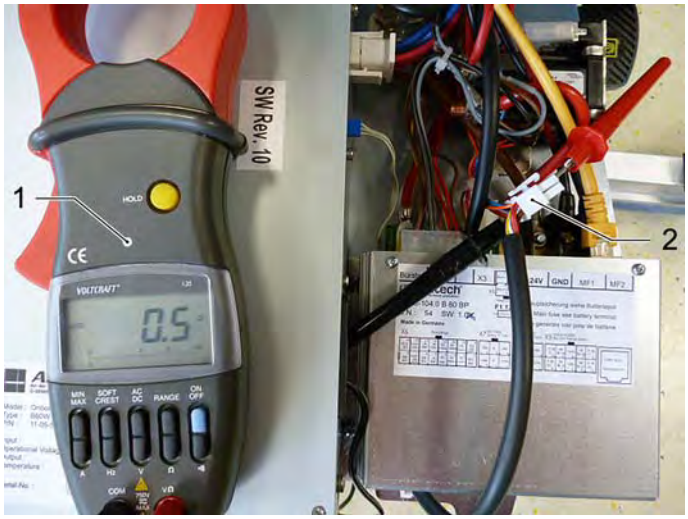
1 Measuring device
2 Measuring probe on the plug-in contact 5 (X9).
3 Measuring probe on the plug-in contact 10 (X9).
➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the voltage measuring device as shown in the illustration.
➔ Actuate drive lever.

Display on the voltage measuring unit, approx. battery voltage.

6.23.13Current measurement of lifting motor vacuum bar

1 Measuring device
2 Lifting motor cable
➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the measuring device to the lifting motor cable as shown in the illustration.
➔ Actuate drive lever.
➔ Measure the current.

6.23.14Resistance measurement micro switch lifting motor brush head



1 Measuring device
2 Plug for lifting motor cable

Lifting motor retracted:

➔ Connect the measuring probe on the plug-in contact 8 (X9).

➔ Connect the measuring probe on the plug-in contact 9 (X9).

Measured value: 0.5 Ohm

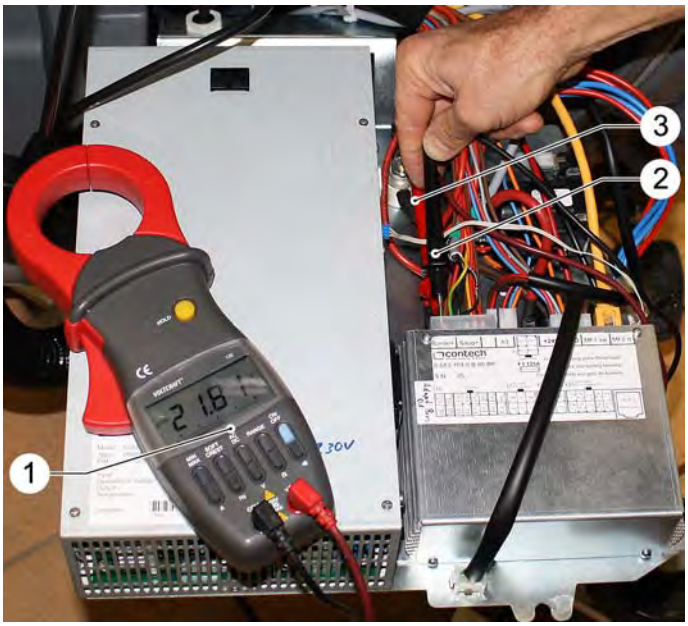
Lifting motor extended:

➔ Connect the measuring probe on the plug-in contact 8 (X9).

➔ Connect the measuring probe on the plug-in contact 4 (X9).

Measured value: 0.5 Ohm

6.23.15Voltage measurement water pump on terminal X6



1 Measuring device

2 Measuring probe on the plug-in contact 7 (X6).

3 Measuring probe on the plug-in contact 15 (X6).

➔ Plug in the Intelligent Key.

➔ Turn the programme selector switch to the respective programme.

➔ Connect the voltage measuring device as shown in the illustration.

➔ Actuate drive lever.

Display on the voltage measuring unit, approx. battery voltage.

6.23.16Current measurement of water pump

1 Connecting cable water pump

2 Measuring device

➔ Plug in the Intelligent Key.

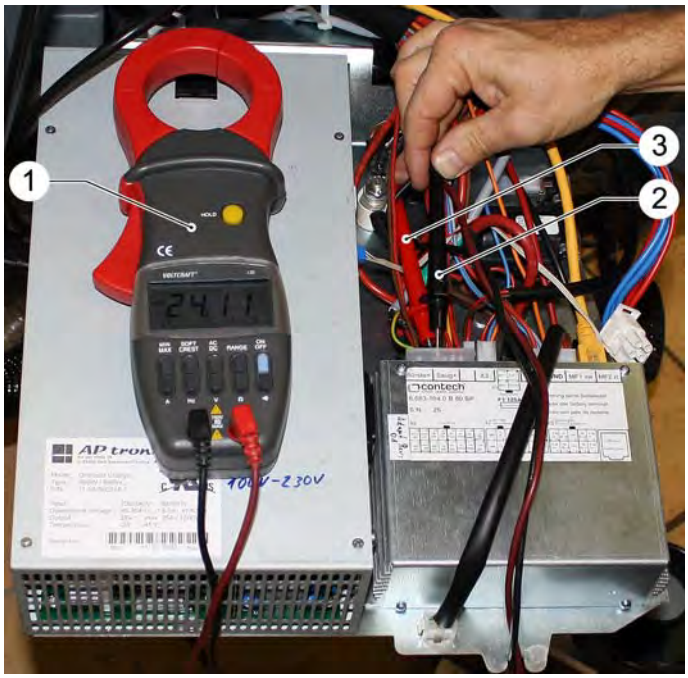
➔ Turn the programme selector switch to the respective programme.

➔ Connect the measuring device to the connecting cable of the water pump as shown in the illustration.

➔ Actuate drive lever.

➔ Measure the current.

6.23.17Voltage measurement detergent dosing pump on terminal X6 (5/13)



1 Measuring device

2 Measuring probe on the plug-in contact 5 (X6).

3 Measuring probe on the plug-in contact 13 (X6).

➔ Plug in the Intelligent Key.

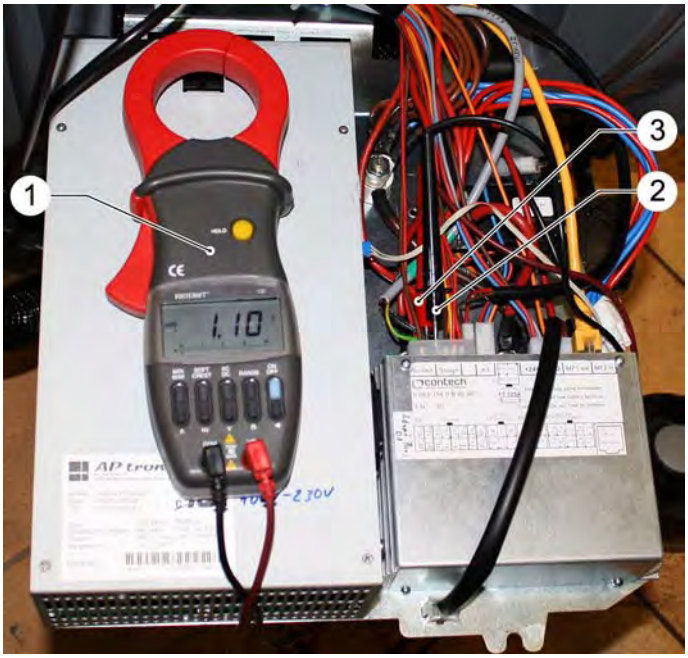
➔ Turn the programme selector switch to the respective programme.

➔ Connect the voltage measuring device as shown in the illustration.

➔ Actuate drive lever.

Display on the voltage measuring unit, approx. battery voltage.

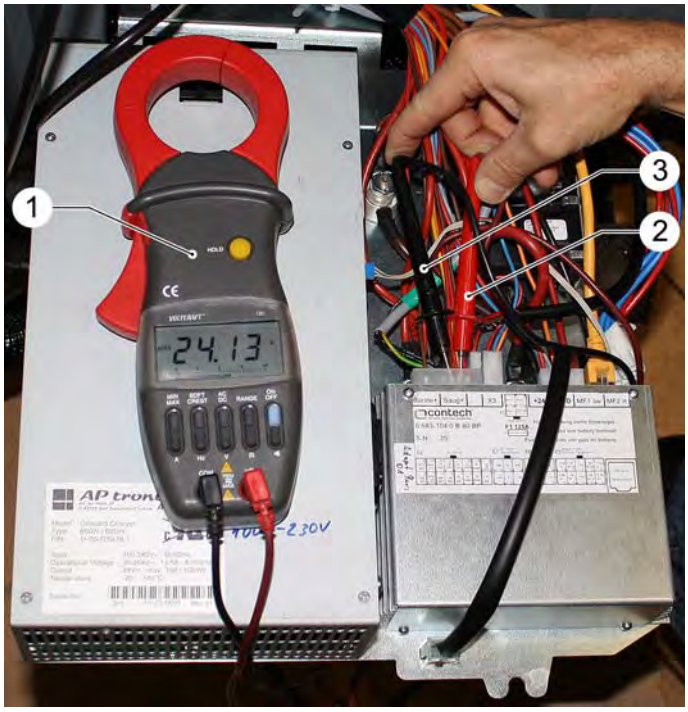
6.23.18Voltage measurement detergent dosing pump (0.5%) on terminal X6 (5/14)



1 Measuring device
2 Measuring probe on the plug-in contact 5 (X6).
3 Measuring probe on the plug-in contact 14 (X6).
➔ Plug in the Intelligent Key.
➔ Set the detergent dosing to 0.5%.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the voltage measuring device as shown in the illustration.
➔ Actuate drive lever.
display:

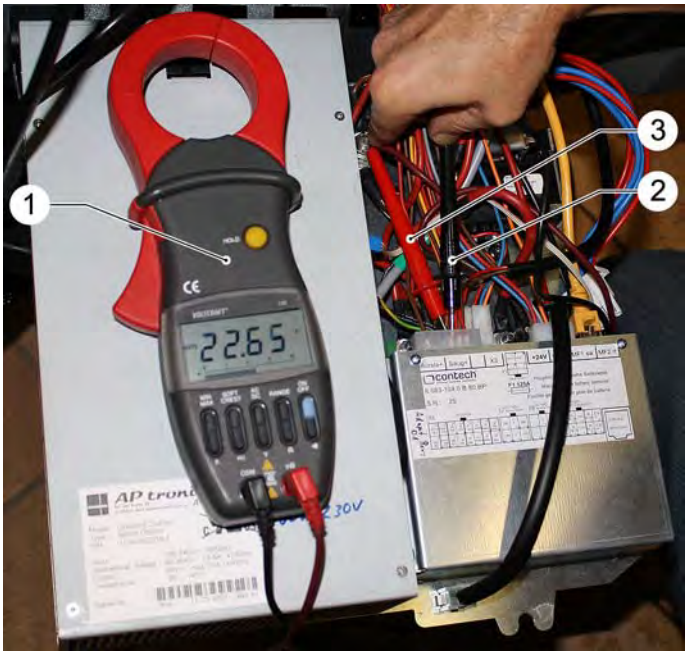
Adjustment mode	Dosage	Voltage measurement
Eco mode	0,5 %	1.5 V
Normal mode	1,0 %	2.2 V
Increased brush contact pressure	3,0 %	6.7 V
Intense mode	3,0 %	6.7 V

6.23.19Voltage measurement water dosing valve on terminal X6 (3/4)



1 Measuring device
2 Measuring probe on the plug-in contact 3 (X6).
3 Measuring probe on the plug-in contact 4 (X6).
➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the voltage measuring device as shown in the illustration.
➔ Actuate drive lever.
Display on the voltage measuring unit, approx. battery voltage.

6.23.20Voltage measurement release signal water dosing valve on terminal X6 (12/4)



1 Measuring device
2 Measuring probe on the plug-in contact 4 (X6).
3 Measuring probe on the plug-in contact 12 (X6).

➔ Plug in the Intelligent Key.

➔ Turn the programme selector switch to the respective programme.

➔ Connect the voltage measuring device as shown in the illustration.

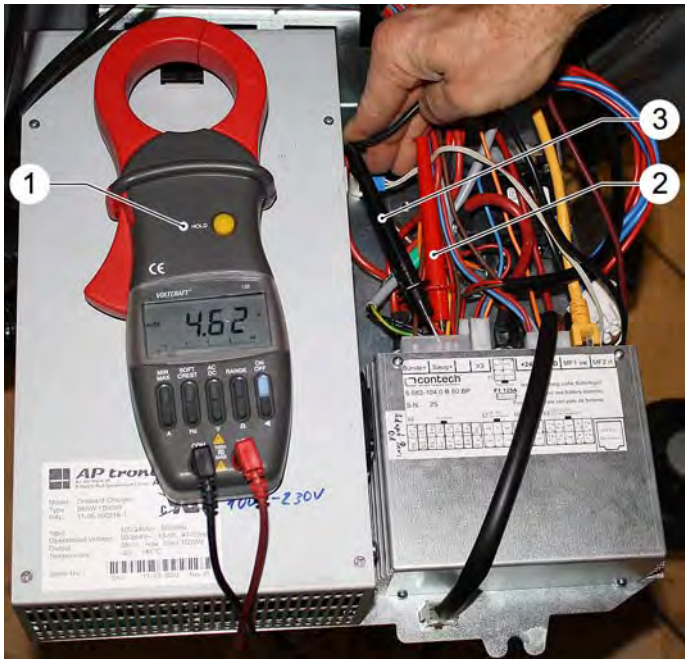
➔ Actuate drive lever.

Display on the voltage measuring unit, approx. battery voltage.

The release signal will be emitted once the brushes run. Only then will the water dosing valve work. If there is no release signal, the water dosing valve is not functional.

6.23.21Voltage measurement water dosing valve on terminal X6 (11/4)

Water dosing valve in idle position



1 Measuring device
2 Measuring probe on the plug-in contact 11 (X6).
3 Measuring probe on the plug-in contact 4 (X6).

➔ Plug in the Intelligent Key.

➔ Turn the programme selector switch to the respective programme.

➔ Connect the voltage measuring device as shown in the illustration.

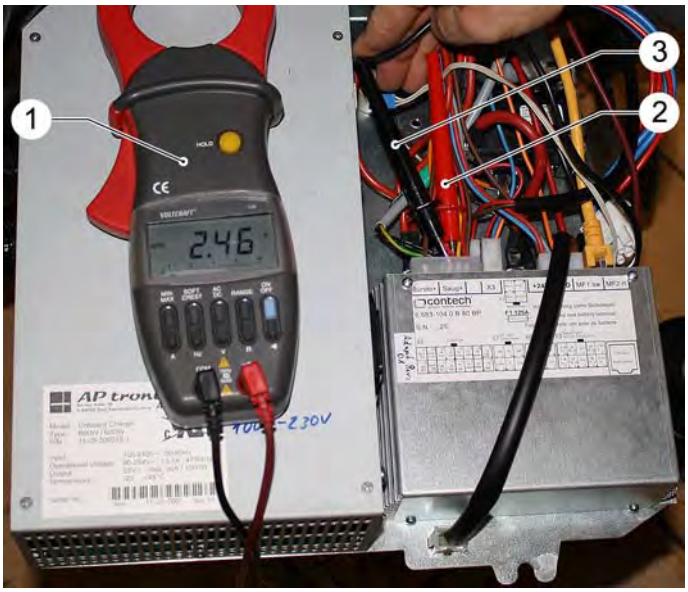
➔ Actuate drive lever.

display:

Measured with the red KIK key.

– Dosing valve closed ~ 4.6 V.
– Water dosing valve open, 1.8 - 3.6 V depending on the setting of the regulating knob for the water volume.

Water volume setting 62%

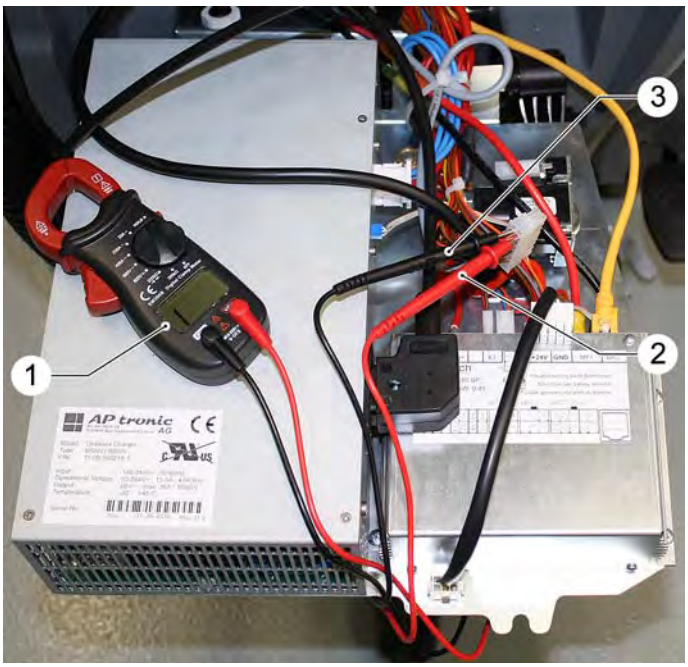


1 Measuring device
2 Measuring probe on the plug-in contact 11 (X6).
3 Measuring probe on the plug-in contact 4 (X6).
➔ Plug in the Intelligent Key.
➔ Turn the programme selector switch to the respective programme.
➔ Connect the voltage measuring device as shown in the illustration.
➔ Actuate drive lever.

Display on the voltage measuring unit, 2.46 Volt.

6.23.22 Resistance measurement of float switch of wastewater tank

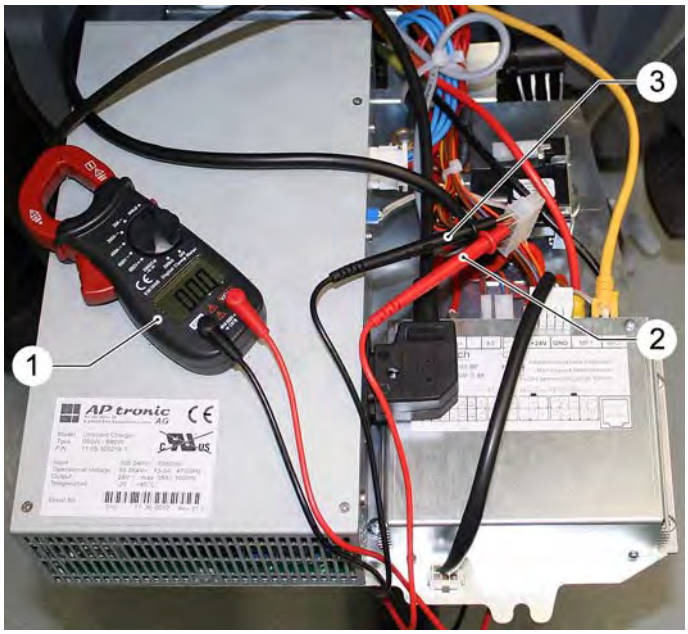
Tank empty, float in bottom position on terminal X6 (2/10)



1 Measuring device
2 Measuring probe on the plug-in contact 2 (X6).
3 Measuring probe on the plug-in contact 10 (X6).
➔ Connect the measuring device to the float switch plug X6 (2/10) as shown in the illustration.

Measured value: Overload.

Tank full, float in upper position



1 Measuring device
2 Measuring probe on the plug-in contact 2 (X6).
3 Measuring probe on the plug-in contact 10 (X6).
➔ Connect the measuring device to the float switch plug X6 (2/10) as shown in the illustration.

Measured value: 0 Ohm

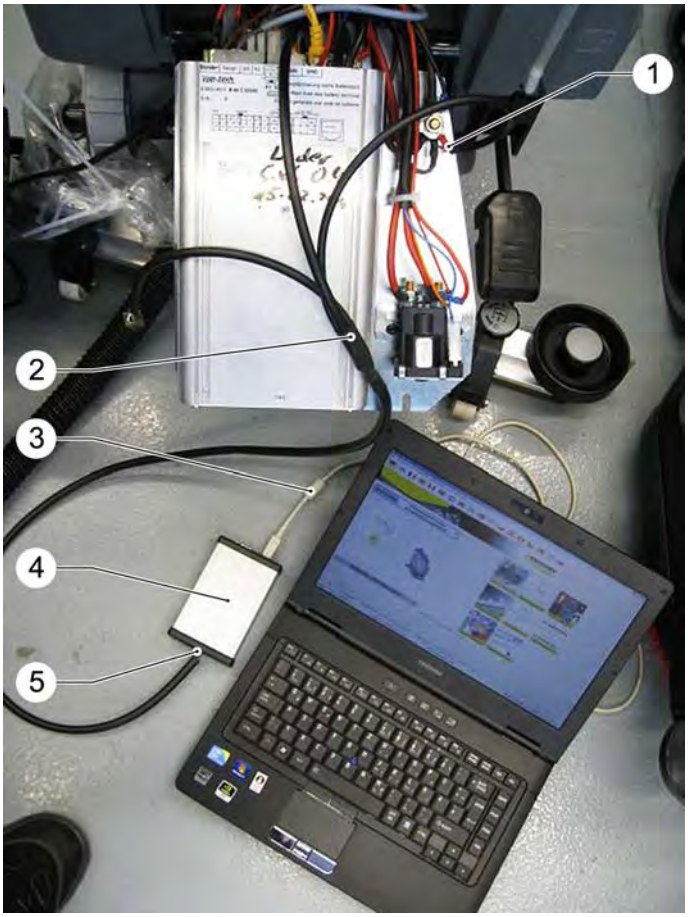
6.24 Connect the service module

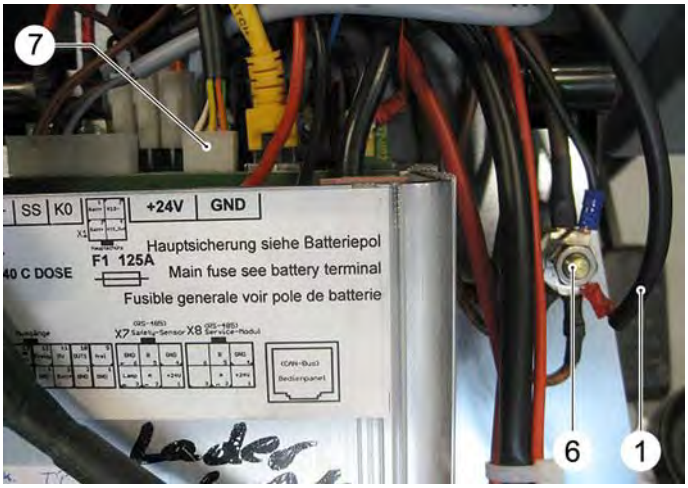
Note

A prerequisite is the service programme software version V5.1.
The service programme software is available at Kärcher Inside.
The service module A9 must be updated with the latest version of the service module software.

Caution

Only use service programme software version V5.1 or higher.
Do not connect service programme software V5.0 or older to the appliance. This could lead to malfunctions of the appliance or the destruction of the control panel and control board.





1 Negative wire
2 Y split service bus cable
3 USB interface cable between A9 and laptop
4 Service module A9
5 AMP bushing
6 Negative terminal
7 Connection, service module A9 into the module bus

➔ Turn off the appliance.
➔ Integrate the service module A9 into the module bus of the machine (you will only need the white bus plug).
➔ Connect the black AMP bushing of the Y split service bus cable to the black AMP plug of A9.
➔ Tightly connect the negative wire of the Y split service bus cable to the negative connection of the machine. This is important as the service module or the control electronics might get damaged otherwise.
➔ Connect the PC/laptop to the service module A9 via the USB interface.
➔ Plug in the Intelligent Key.
➔ Set the programme selector switch of the machine to position 1.
➔ Start the service programme.
➔ Perform automatic scanning to recognize the device automatically.
➔ If the device is not recognised, the selection must be repeated.
– LED blinks on service module.
Transfer the new software
➔ Select the update software.
Select the software, transfer it to the device and follow the programme instructions.
Do not interrupt the download!

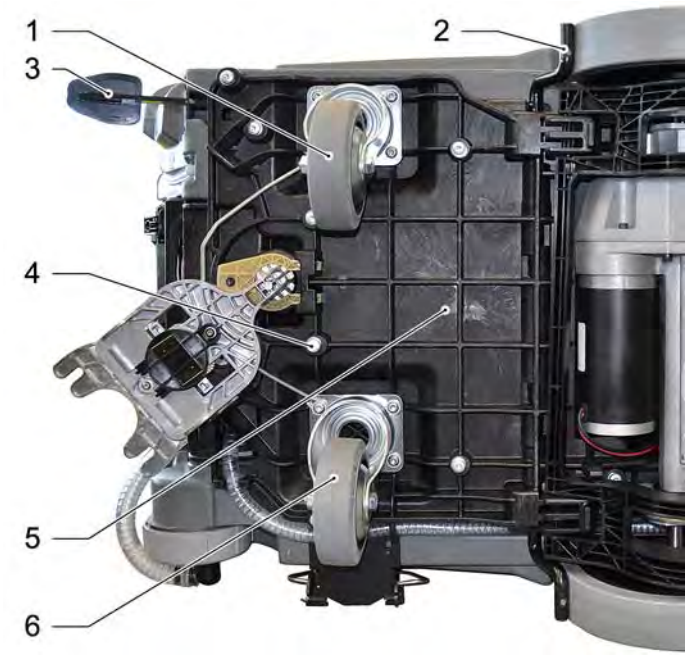
Note

The display of the device switches off during the software transfer.
The successfully transferred software can be displayed on the device.

After transferring the software, the following settings must be made using the grey or red KIK key.
– Load the factory settings.
– Adjust the used brush head to "R or D".
– Set up the charge curve for the installed battery used in the battery menu.
➔ Turn the device off and back on.
The device can be started after all the settings have been made.

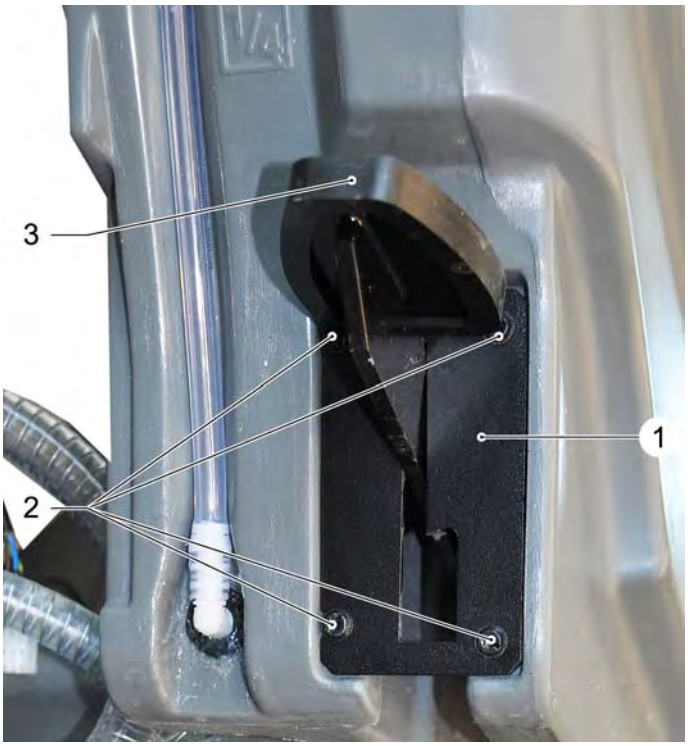
Service programme for floor cleaners and sweepers V5.1

6.25 Parking brake



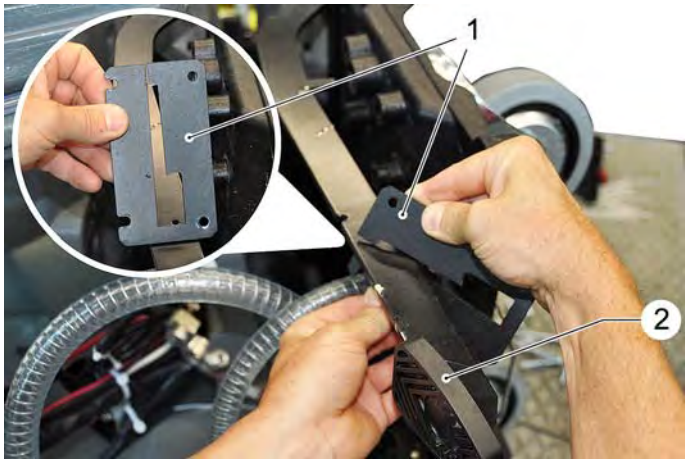
1 Steering roller
2 Brake linkage
3 Parking brake/ foot brake pedal
4 Screws
5 Floor plate
6 Steering roller

➔ Remove the steering rollers.
➔ Loosen screws.
➔ Remove the floor plate.



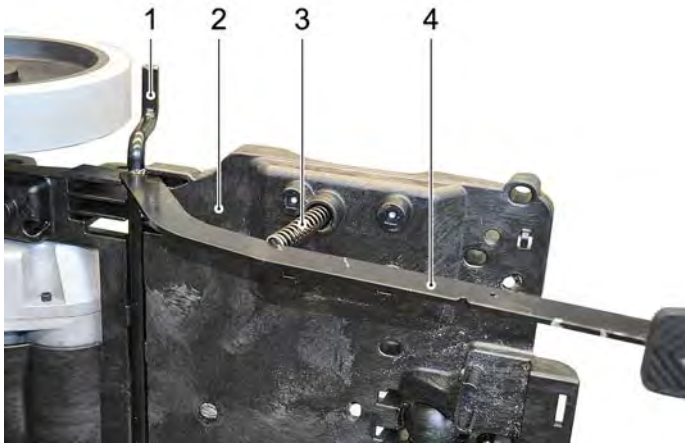
1 Crank
2 Screws
3 Parking brake/ foot brake pedal

➔ Loosen screws.



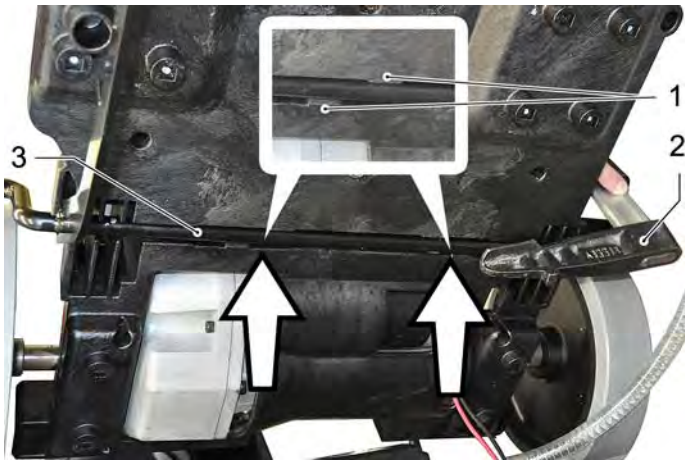
1 Crank
2 Parking brake/ foot brake pedal

➔ Bend the crank slightly.
➔ Remove the crank from the pedal linkage.



1 Brake linkage
2 Chassis
3 Spring
4 Pedal linkage

➔ Remove the brake linkage from the chassis.



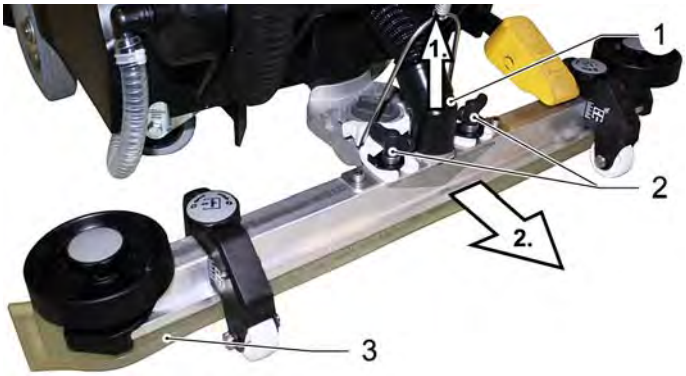
1 Latching tabs
2 Vice
3 Brake linkage

➔ Push the brake linkage into the lock noses with the vice.

7 Maintenance and care

7.1 Replacing the suction lips

If the suction lips are worn down by about 1 cm, they must be reversed.
If the suction lips are worn out or defective, they must be replaced.



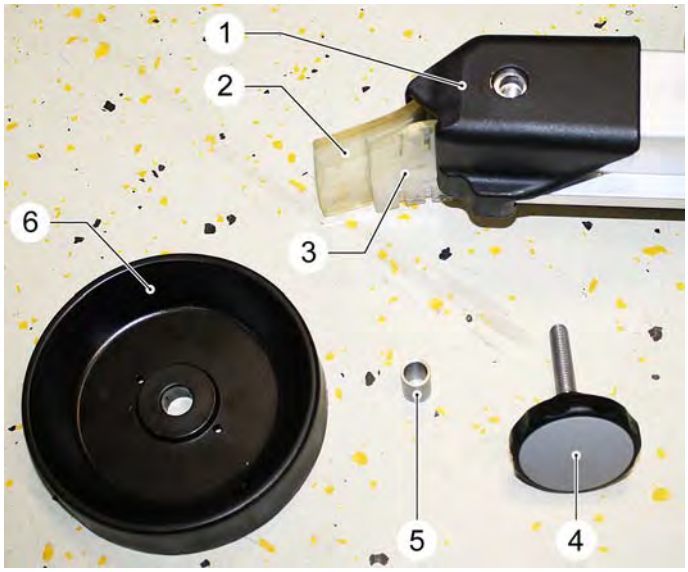
1 Suction hose
2 Wing screws of suction bar support
3 Wear indicator

➔ Pull out the suction hose from the vacuum bar.

➔ Loosen the wingscrews of the vacuum bar suspension and pull the vacuum bar out of the intake.

1 Star handle screw
2 Deflector disc

➔ Loosen the star handle screws on both sides of the vacuum bar.

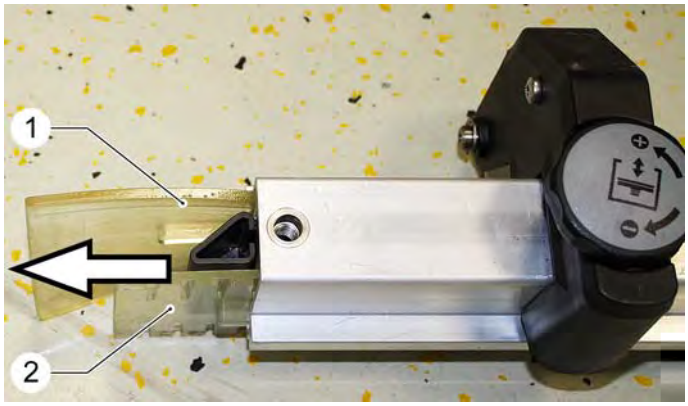


1 Suction lip holder
2 Rear vacuum lip
3 Front vacuum lip
4 Star handle screw
5 Sleeve
6 Deflector disc

➔ Remove the deflector discs.

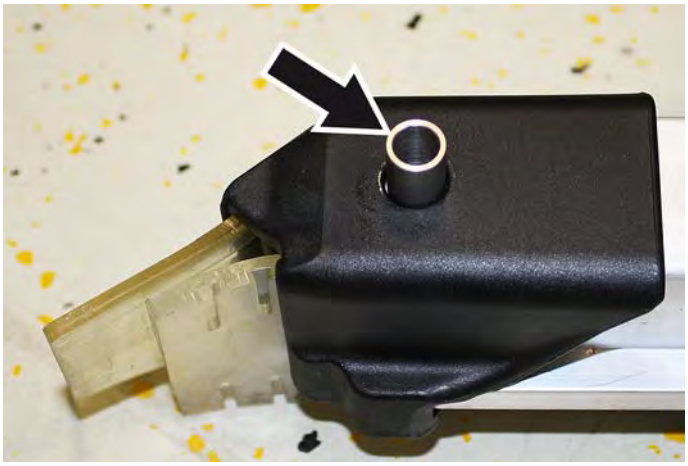
1 Suction lip holder

➔ Pull the suction lip holder off on both sides.



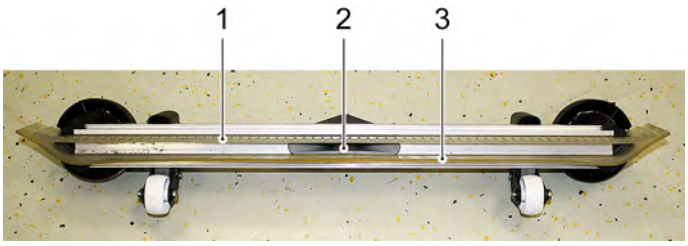
1 Rear vacuum lip
2 Front vacuum lip

➔ Pull the suction lips out on the side, replace if required



➔ When assembling the vacuum bar ensure the correct seating of the sleeve.

7.2 Clean the vacuum bar

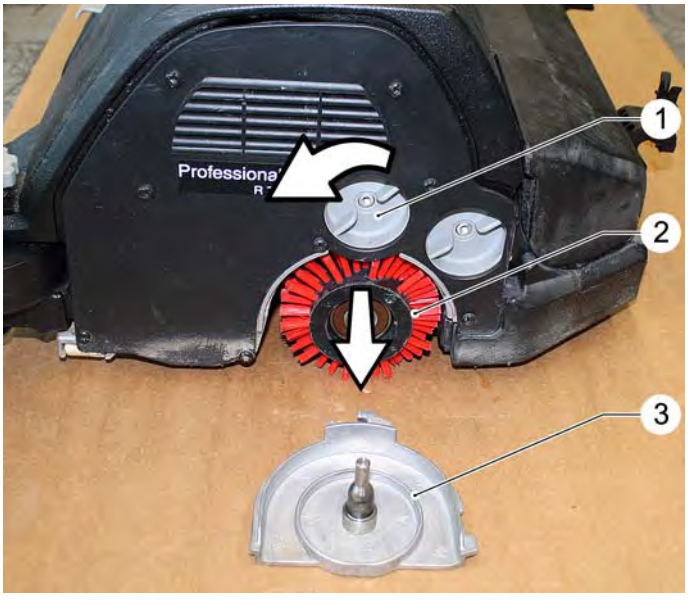


1 Front vacuum lip
2 Suction support
3 Rear vacuum lip

➔ Clean the suction lips.

➔ Clean the contamination off the vacuum stub.

7.3 Replacing the brush rollers



1 Unlock, bearing lid
2 Brush roller
3 Bearing lid

➔ Move the brush head into the top position

➔ Press the release button of the bearing cover and remove the bearing covers from the brush head.

➔ Pull the brush roller out of the brush head.

1 Brush roller

➔ Check the bristle length.
Replace the brush roller if the bristles are shorter than 10 mm.

7.4 Check seal on the cover of the waster-water tank / replace.

1 Seal
2 Cover dirt water reservoir

➔ Check the seal for contamination and defects. Clean or replace if necessary.

8 Troubleshooting

8.1 Faults without display on the console

Fault	Remedial action
Appliance cannot be started	– Check whether the intelligent key has been inserted. – The appliance is in standby mode. Set the programme selector switch to position "1" (OFF) and then to the desired programme. – Connect / check / charge batteries. – Check battery charge control. – Check/replace the fuse. – Check / replace programme selector switch. – Check/replace the main relay. – Check/replace the circuit board (A1). – Check the connecting cable between the control panel board and the programme selector switch. – Check if the charger is connected / unplug. – Check / replace the charger.
Machine does not move	– Check if the charger is connected / unplug. – Check/replace the fuse. – Check / replace programme selector switch. – Check/replace the circuit board (A1). – Check/replace drive motor. – Emergency brake closed / open. – Drive motor has reached 90°C for more than 20 seconds / let it cool off. – Battery voltage too low / charge battery / perform reset with Easy Operation Button
Appliance travels slowly	– Drive motor has reached 80°C. Motor voltage was reduced to 1/3.
No or insufficient water supply	– Check / fill up fresh water reservoir. – Unscrew the lock of the fresh water reservoir. Remove and clean the fresh water filter. Insert the filter and screw in the lock. – Check / clean the water supply. – Check / clean / replace water dosing valve; remove obstruction / kink location. – Check/replace the water pump. – Check / clean the water distribution channel.
Insufficient vacuum performance	– Check whether the suction performance is set to "Whisper". – Clean / check / replace the seal between wastewater reservoir and cover and check for tightness. – Check / replace the float. – Check / clean the lint trap. – Check / clean / replace the vacuum lips on the suction bar. – Check if the suction hose is chocked / cracked; remove obstruction / replace if necessary. – Check whether the cover on the wastewater drain hose is closed. – Check the setting of the vacuum bar. – Check/replace the suction turbine. – Check whether the wastewater reservoir is closed properly.
Suction turbine does not run	– Wastewater reservoir full / empty. – Float switch of wastewater tank is blocked or defective / replace.

Fault	Remedial action
Suction turbine does not switch off after trailing time	– Float switch of wastewater tank is blocked or defective / replace.
Insufficient cleaning result	– Check / clean / replace the brushes for wear and tear and contamination. Bristle length at least 10 mm. – Check / fill up fresh water reservoir. – Check / clean the water supply. – Check / adjust the detergent supply. – Check / clean / replace the solenoid valve for the water supply. – Check the brush rotation direction and speed (FACT).
Vacuum bar cannot be raised / lowered.	– Lifting mechanics blocked / check / remove blockage. – Check / replace programme selector switch. – Check / replace the micro switch of the lifting motor. – Check the lifting motor via test mode.
Cleaning head cannot be raised / lowered.	– Lifting mechanics blocked / check / remove blockage. – Check / replace programme selector switch. – Check / replace the micro switch of the lifting motor. – Check the lifting motor via test mode.
Detergent is not getting mixed in	– Check the content of the cleaning agent container – Check / replace the detergent pump. – Check the detergent hose. – Increase the water volume. – Check flowmeter for obstructions / clean.
Brushes do not turn	– If the over-current switch in the electronics system has been triggered, remove the intelligent key and reinsert it. Switch on/off the appliance again. – Check the electrical connection on the brush motor. – Check the brush motor via test mode. – Check whether the brush rollers / disc brush is blocked / remove foreign matters / replace brush rollers / disc brushes. – Check/replace the toothed belt. – Check / replace control PCB. – Check connector on cleaning head / insert. – Check / replace programme selector switch.
Charger is not working ventilator on charger does not start up	– Wiring "W9“ between the control and the charger is interrupted.
The appliance has a short runtime.	– The charger parameters in the control electronics are adjusted incorrectly. – Check / replace the batteries.
Tank cannot be filled with water valve (Auto fill-in)	– Sieve contaminated / clean / replace.
Water valve (Quick fill in) does not shut off	– Diaphragms plugged / clean / replace.
Electronic malfunctions	– Switch on/off the appliance again. – Check battery voltage (> 22.0 V) – Disconnect the battery for 2 minutes. – Take the appliance into operation again

8.2 Faults with display

Display shows	Description / cause	Remedy
ERR_U_BATT_001	Battery voltage too low.	Charge, replace battery.
ERR_K1_002	Check if the contact of the main contactor is stuck.	Replace main contactor.
ERR_ZK_2V_003 ERR_ZK_10V_004	Internal fault of control electronics.	– Switch on/off the appliance again. – Check the battery connection. – Measure the battery voltage (>22V). – Disconnect the load connections to the different consumers to detect possible short circuits. – Check cables to the drive motor, the brushes and the suction turbine motor for short circuits.
ERR_5V_005	Fault in 5 V supply voltage.	– Switch on/off the appliance again. – Internal fault. – Replace control electronics.
ERR_U_H1_006 ERR_U_H1_007 ERR_U_H1_008 ERR_U_H1_009	Internal fault of control electronics.	– Switch on/off the appliance again. – Check battery voltage (>22V). – Disconnect the battery for 2 minutes. – If the fault is still present, conduct further testing: – Disconnect the drive motor MF+ and MF- and switch the appliance on. If the faults persist, replace the control electronics. If the fault disappears, check the wiring of the drive motor. – Disconnect the suction turbine and the brush motor and switch the appliance on. If the faults persist, replace the control electronics. If the fault disappears, check the wiring of the drive motor.
ERR_K1_010	Diagnosis of the main contactor and its actuation.	– Switch on/off the appliance again. – Check battery voltage (>22V). – Disconnect the battery for 2 minutes. – Check/replace the main contactor. – Replace control electronics.
ERR_K1_011 ERR_K1_012 ERR_K1_013	Diagnosis of the main contactor and its actuation.	– Switch on/off the appliance again. – Check battery voltage (>22V). – Check the cables to the main contactor. – Replace main contactor.
ERR_K1_014	Diagnosis of the watchdog and its actuation.	– Switch on/off the appliance again. – Check battery voltage. – Replace control electronics.

Display shows	Description / cause	Remedy
ERR_FR_015	Power is applied to the brush motor, although no output is switched.	– Switch on/off the appliance again. – Check battery voltage (>22V). – Disconnect the battery for 2 minutes. – Check the brush motor cables. – Replace control electronics.
ERR_FR_016	Short circuit deteced on brush drive.	– Disconnect the cables to the brush motor, then turn the appliance on. – If the fault disappears, find the cable fault. – If the fault persists, replace the control electronics.
ERR_FR_017	Power is applied to the suction turbine, although no output is switched.	– Switch on/off the appliance again. – Check battery voltage (>22V). – Disconnect the battery for 2 minutes. – Check the brush motor cables. – Replace control electronics.
ERR_FR_018	Short circuit deteced on suction turbine drive.	– Disconnect the cables to the suction turbine, then turn the appliance on. – If the fault disappears, find the cable fault. – If the fault persists, replace the control electronics.
ERR_FR_022	Voltage on the drive switch outside permissible range.	– Switch on/off the appliance again. – Check the drive switch. – Check the operating field cables. – Replace the drive switch. – Replace the operating panel PCB.
ERR_FR_024	Directional switch in the drive switch, illogical status.	– Check the operating field cables. – Replace the drive switch. – Replace the operating panel PCB.
ERR_STL_026 until ERR_STL_043	Internal fault of control electronics.	– If the battery has charged over 23 V and the ambient temperature is below 40°C, there is a fault in the control electronics. – Replace control electronics.
ERR_U_BATT_044	Check battery voltage.	– Check battery voltage (>22V).
ERR_TEMP_045 until ERR_TEMP_048	Overtemperature in the performance jumpers.	– Take appliance to an ambient temperature of +10 to +30°C too cool it off.
ERR_I_BÜRSTE_049	Overcurrent of the brush motors.	– Remove possible blockage of the brush drive. – Check the cables to the brush motor (insulation error). – The selection of the brushes might not be suitable for the floor surface?
ERR_I_TURB_050	Overcurrent of the suction turbine.	– Remove possible blockage of the suction turbine. – Check the suction turbine for ease of movement. – Check the cables for damage.

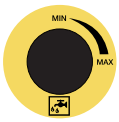
Display shows	Description / cause	Remedy
ERR_PWM_FM_051	Fault in the travel drive.	– Check the cables to the travel drive. – Check the drive motor for damages. – Replace the drive motor.
ERR_PWM_TB_052	Fault in the brush or suction turbine drive.	– Check the cables to the drive. – Check the motor for damages. – Replace the motor.
ERR_BT53	Fault in CAN bus to control part.	– Check the patch cable (yellow) between the control electronics and the operating panel PCB and replace if necessary. – Replace the operating panel PCB. – Replace control electronics.
DaliErr:_000 Err:CS000_TO000	Number of checksum faults / time-out faults. CS: Fault appears > if 50 consecutive faults have occurred. TO: Fault appears > if 50 consecutive faults have occurred.	– Check battery voltage. – Replace control electronics.
DaliErr:_000 Err:CS051_TO051	No communication with the control electronics.	– Check the connecting cable. – Check / replace the charger.
Bat voll	Charging process terminated.	– Incorrect polarity on the relay coil K1. Check the positive and negative cables.

8.3 Warning messages

Display shows	Description	Remedy
Warning temp	Warning temperature >80 °C reached. The actuation of the suction turbine or the brush motor is only occurring with 2/3 of the nominal PWM	– Check the suction turbine and the brush motor for overload.
Red. I motor	Actuation of drive motor reduced.	– Check/let the drive motor cool off.
Hindernis Ignor.	Safety sensor active.	– Check/replace the safety sensor if an obstacle is not the cause.
Bus Error Lader	Charging process interrupted by communication fault to charger.	– Check/replace the three-prong cable between the charger and the control. – Check / replace the charger.
Charging fault	Charging characteristic could not be adhered to.	– Check / replace the charger.
Charging complete	Charging process completed successfully.	
FR Loesen	Drive regulator actuated during startup.	– Release drive regulator. – Test/replace the drive regulator.
ERR_BTSTL_001 ERR_BTSTL_002 ERR_BTSTL_003 ERR_BTSTL_004 ERR_BTSTL_005 ERR_BTSTL_006 ERR_BTSTL_007 ERR_BTSTL_008 ERR_BTSTL_009 ERR_BTSTL_010 ERR_BTSTL_011 ERR_BTSTL_012 ERR_BTSTL_013 ERR_BTSTL_014 ERR_BTSTL_018	Internal fault of control panel board.	– Transfer the current control panel board software to the control panel board via the service module. – If the fault persists, replace the control panel board.
ERR_BTSTL_019	Can bus fault	– Check / replace the patch cable. – Replace operating panel PCB. – Replace the performance part.
ERR_BTSTL018	Bus cable defective. Voltage supply to the control panel board incorrect.	– Check/replace the bus cable. – Replace operating panel PCB. – Replace control electronics.

9 Software diagrams and parameter overview

9.1 Operating elements

	The selection of the individual modes is effected by turning the programme selection switch. ➔ Turn the programme selection switch to select the modes.
	The adjustment of the water volume is effected directly via the rotary knob water. ***Note*** *The adjustment of the water volume via the operator menu is not possible.*
	The adjustment of the driving speed is effected via the rotary knob driving speed. ***Note*** *The adjustment of the driving speed via the operator menu is not possible.*
	The menu is navigated via the information button (info button). ***Note*** The menus displayed relative to the selected mode. Not all menus are available in every mode.
	➔ Rotate the info button to select the parameter.
	➔ Press the info button to confirm the selection.

9.2 Factory setting

The factory settings can be restored in the menu of the grey and red intelligent key.

Note

Many faults result from incorrect settings. Load the factory settings for troubleshooting!

After loading the factory settings, switch of the programme selector switch so that the new parameters can be applied. After that, the following parameters must be set up:

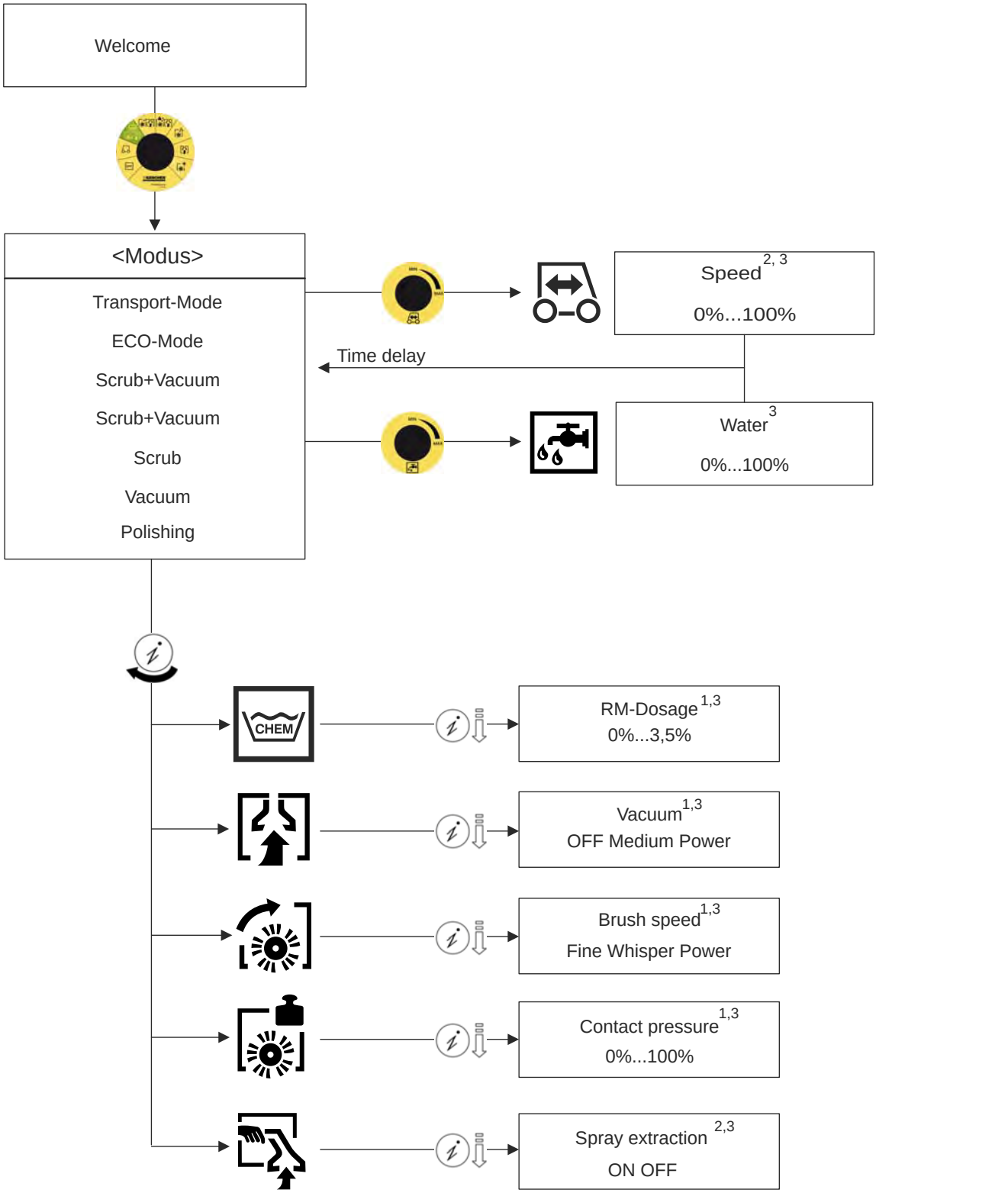
- the language
- Basic settings
- Check battery selection and charging curve
- Check the selection of the brush head

9.3 Main menus

Note

The menus displayed relative to the selected mode. The diagram shows all available menus as an overview.

9.3.1 Function overview of the yellow intelligent key

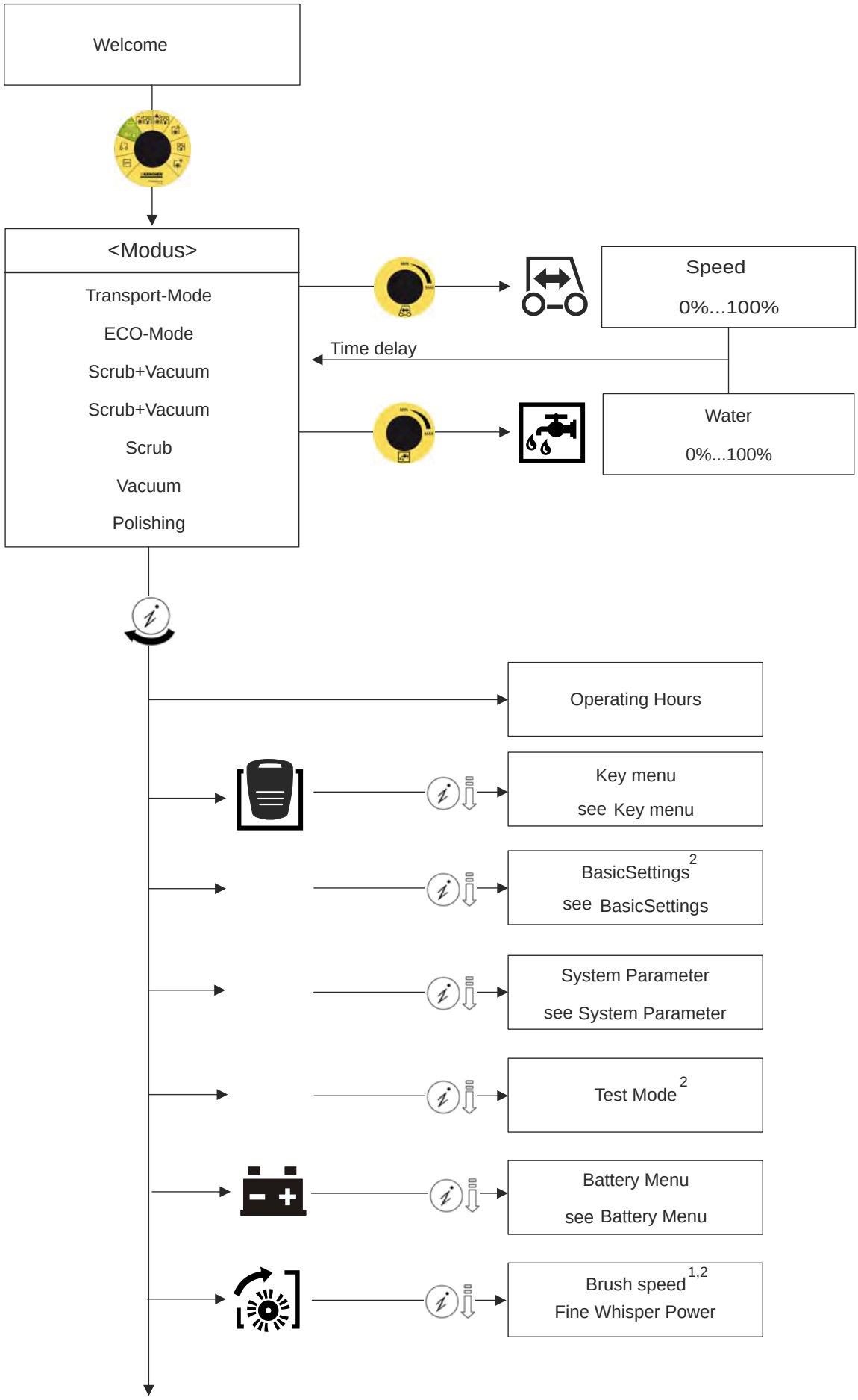


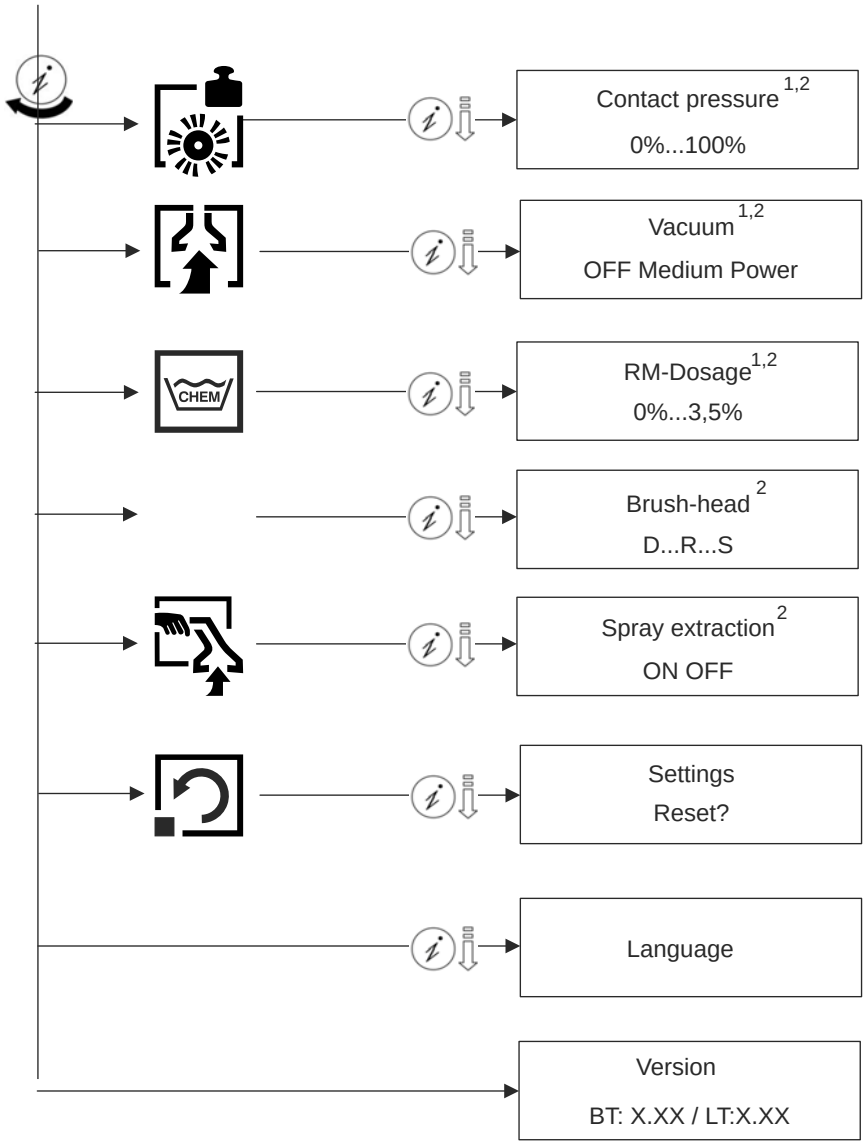
1 Selection not permanent. The setting will be lost if the program selection switch is adjusted.

2 Selection depends on the position of the programme selection switch

3 Those menus must be enabled in the key menu.

9.3.2 Function overview of the grey intelligent key

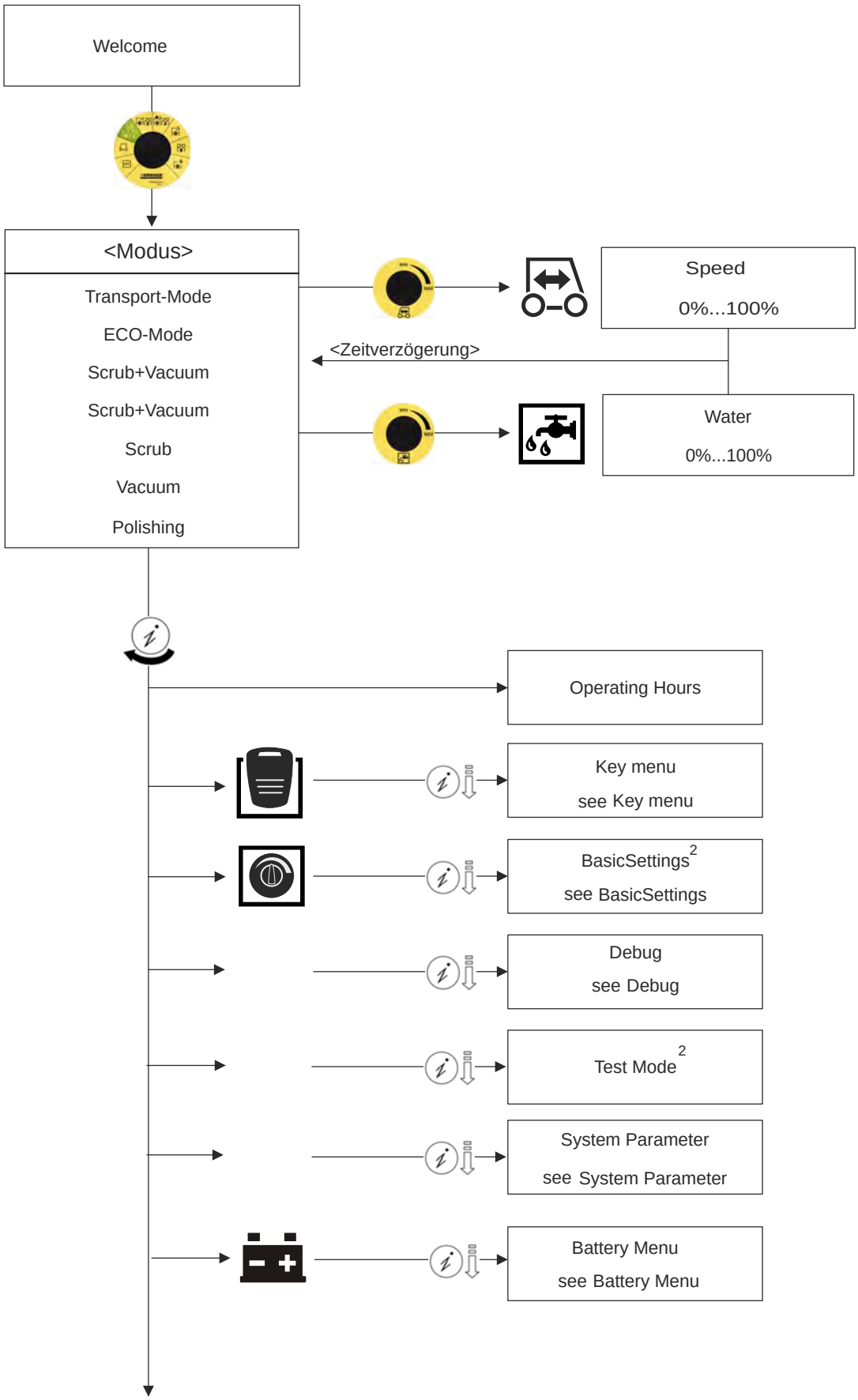


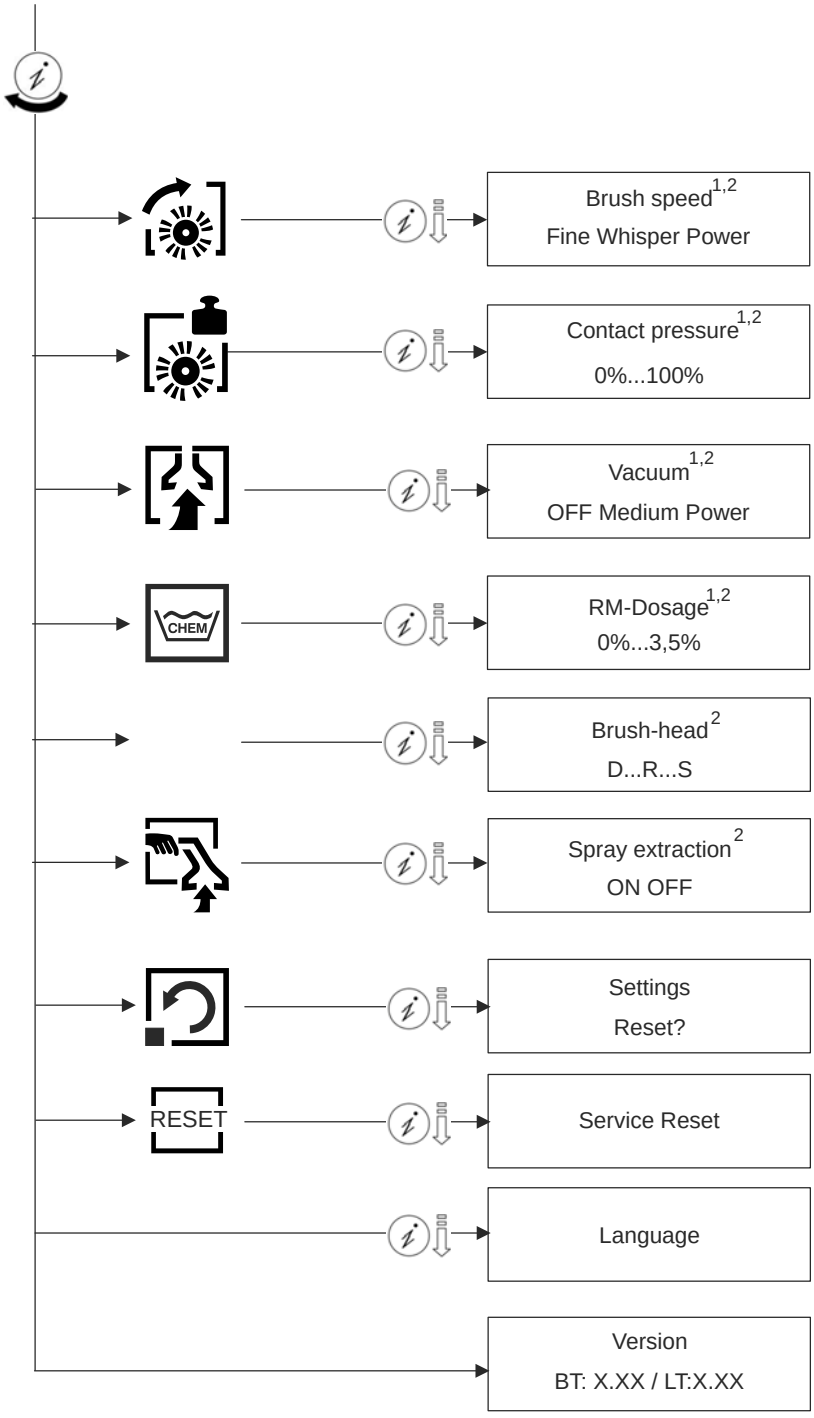


[1] Selection not permanent. The setting will be lost if the program selection switch is adjusted.

[2] Selection depends on the position of the programme selection switch

9.3.3 Function overview of red intelligent key



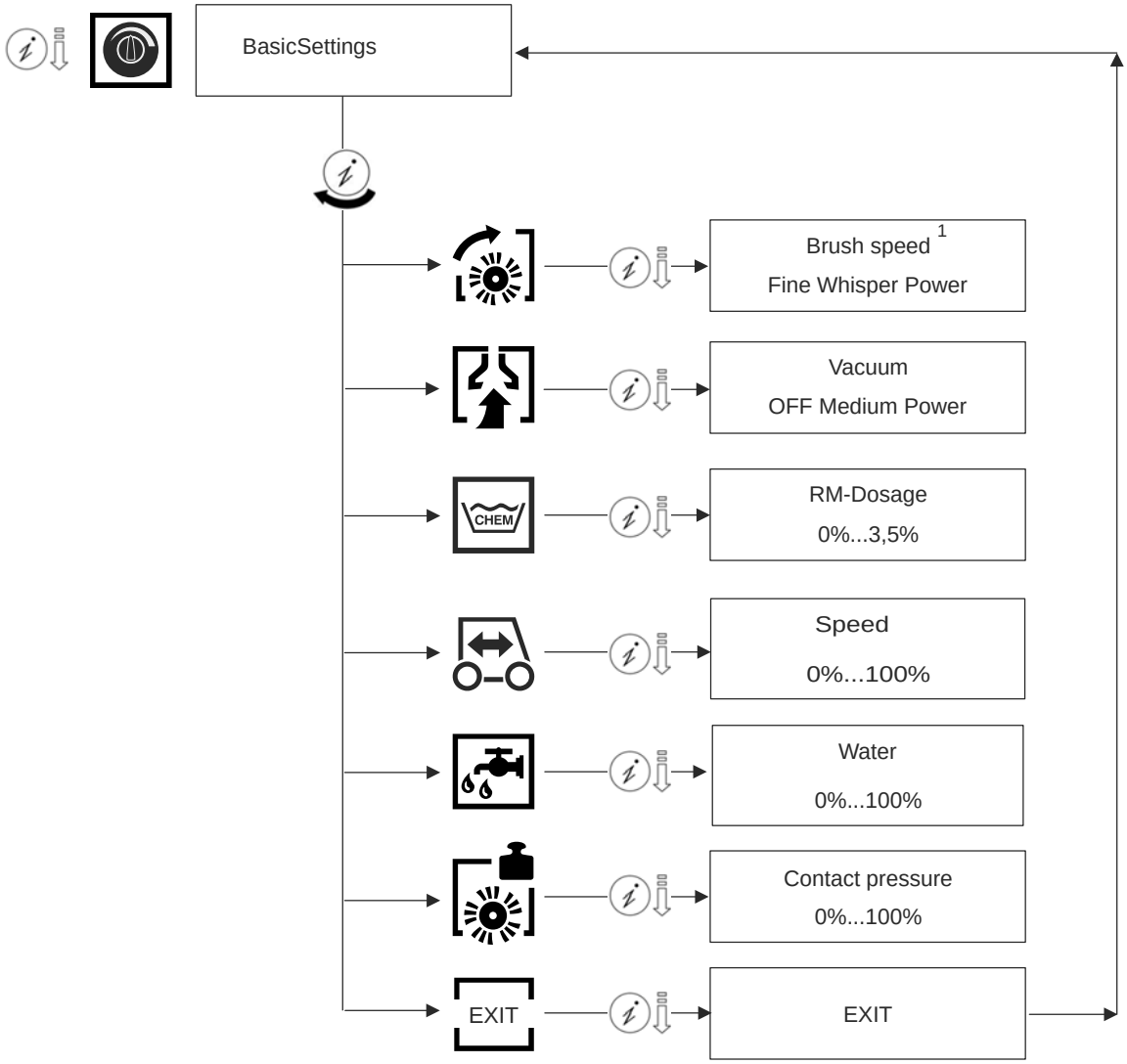


[1] Selection not permanent. The setting will be lost if the program selection switch is adjusted.

[2] Selection depends on the position of the programme selection switch

9.4 Special submenus

9.4.1 Basic settings



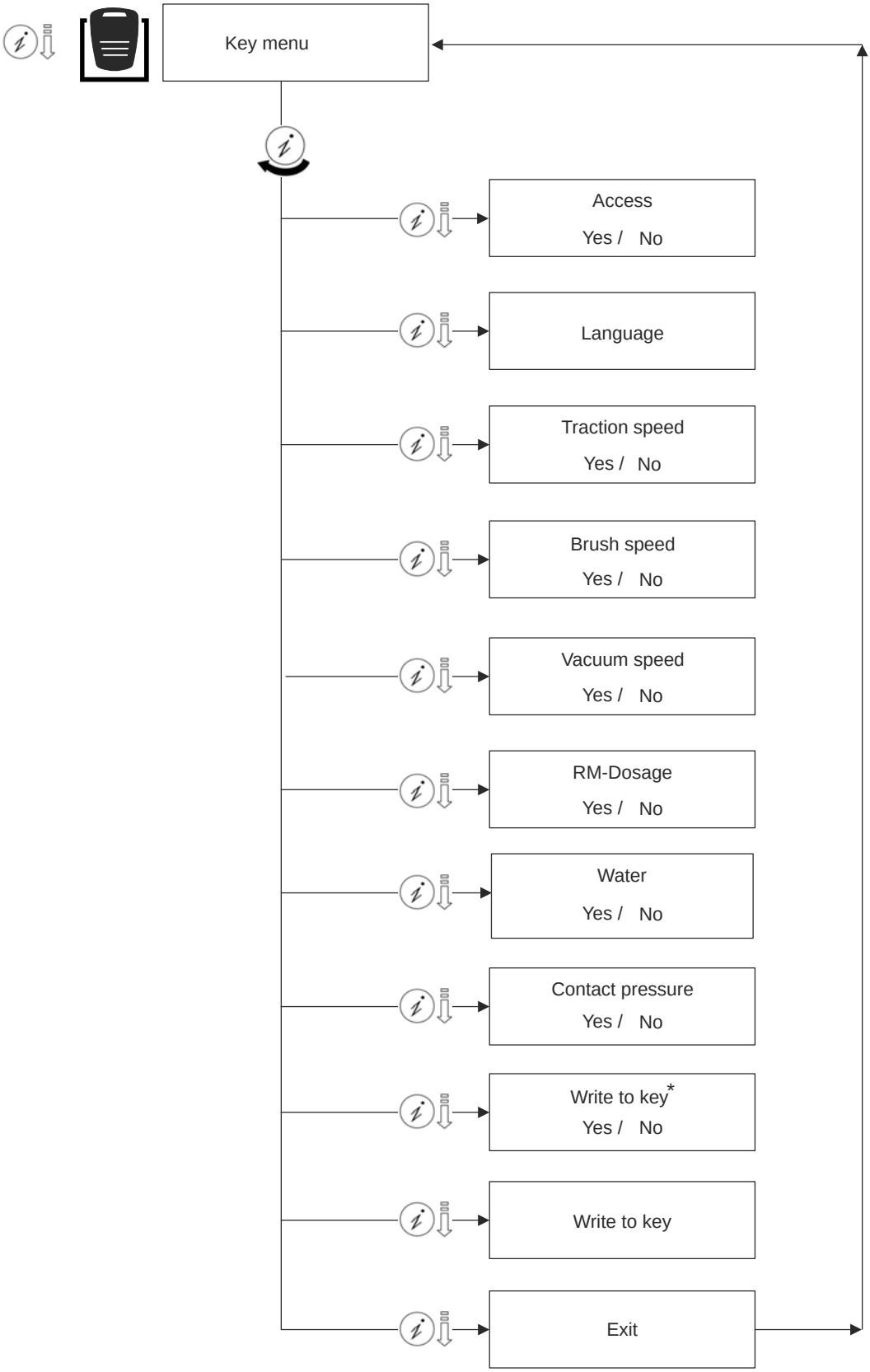
The menu *Basic settings* can only be selected in the cleaning programmes.

Note

The values set up here are only active if the yellow user key does not have any restrictions. If the factory settings are loaded in the menu, all basic settings programmes are reset and must be set up again.

[1] Selection depends on the brush head. Is only displayed with the R-head.

9.4.2 Key menu



*Additional yellow keys can be described using the set up parameters.

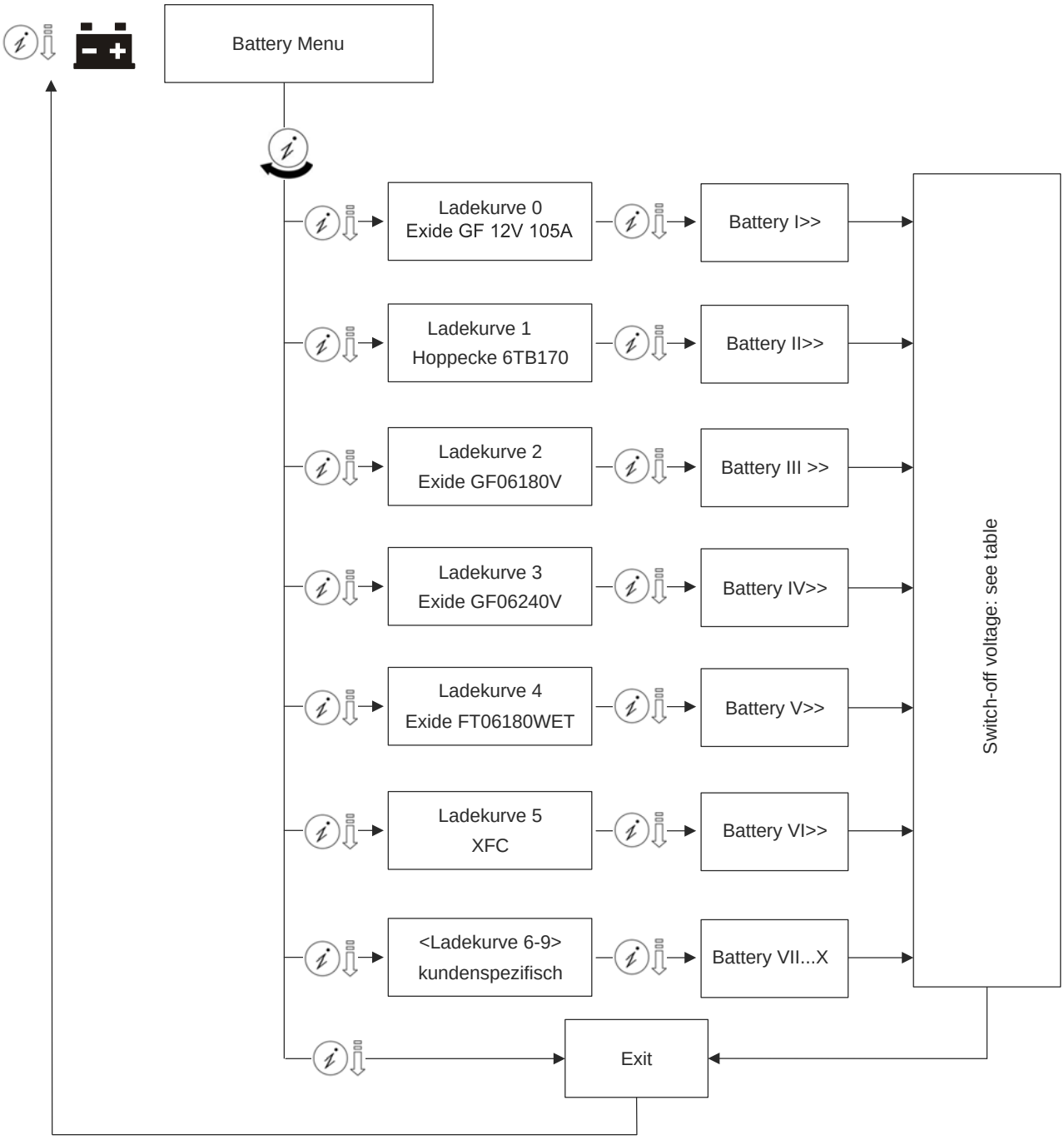
Note

This menu allows the user of the yellow user key additional settings with the I button.
The user can only use the enabled parameters.
Parameter are active immediately and until a new cleaning programme is selected via the programme selector switch. After that, the standard values are restored.

Note

After selecting the key menu, the key to be programmed must be inserted in the key holder within 10 seconds.

9.4.3 Battery menu

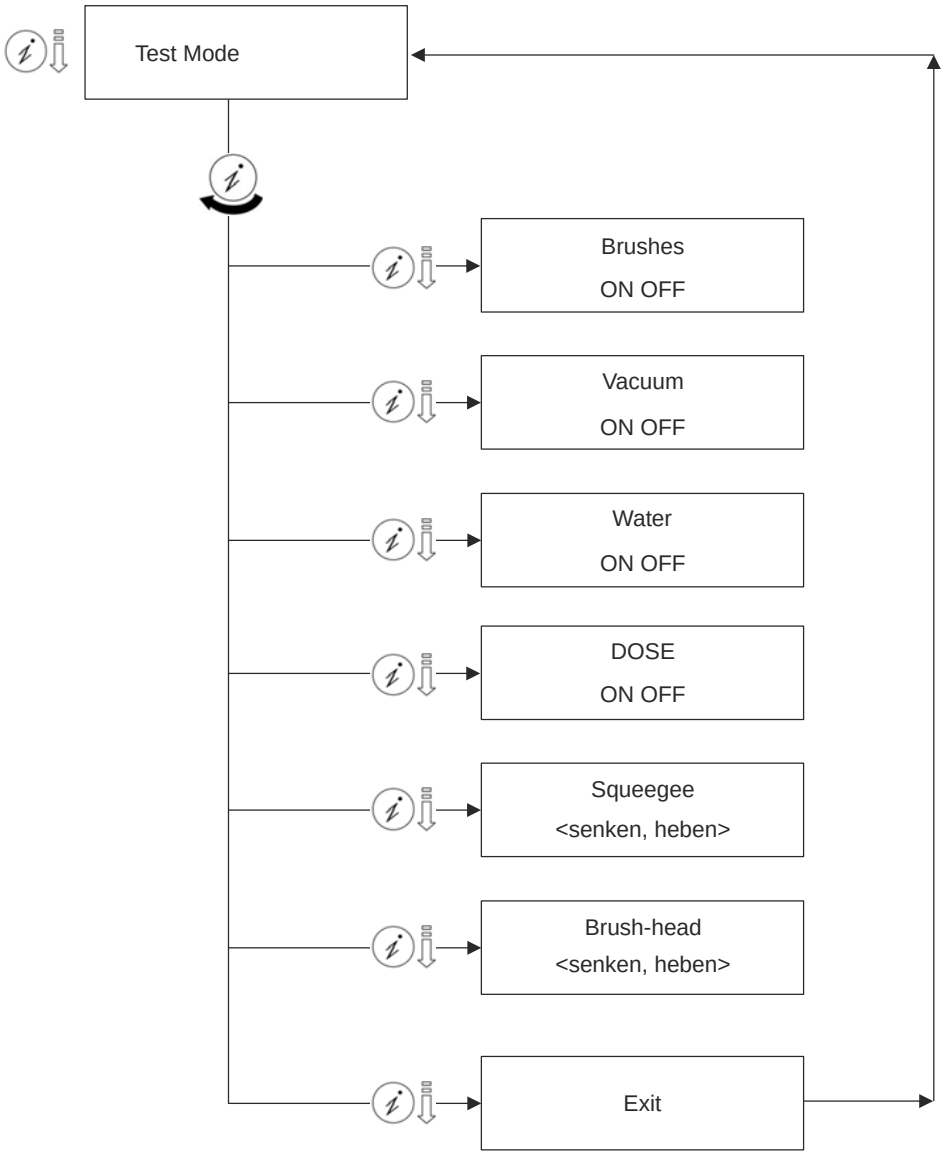


Switch-off voltage	**Battery I** ***Charging curve = 0***	**Battery II** ***Charging curve = 1***	**Battery III** ***Charging curve = 2***	**Battery IV** ***Charging curve = 3***	**Battery V** ***Charging curve = 4***	**Battery VI** ***Charging curve = 5***	**Battery VIII - X** ***Charging curve = 6***
Low Batt...	EXIDE GF12V105 A	HOPPECK E 6TB170	EXIDE GF06180V	EXIDE GF06240V	EXIDE FT06180W ET	XFC rapid charge capable, external charger	External charger, customisable
A = 10 A	23.4 V	23.0 V	23.5 V	23.6 V	23.2 V	23.5 V	23.5 V
B = 30 A	21.1 V	22.8 V	23.1 V	23.3 V	22.1 V	23.5 V	23.5 V
C= 50 A	19.6 V	22.7 V	22.3 V	22.9 V	21.1 V	23.5 V	23.5 V
d = 60 A	19.4 V	22.6 V	20.8 V	22.3 V	19.8 V	23.5 V	23.5 V
E = 70 A	19.2 V	22.5 V	19.9 V	21.3 V	19.6 V	23.5 V	23.5 V

These values refer to the switch-off of the brush motor and suction turbine units. The switch-off differs with the current pickup.
The switch-off takes place after 60 seconds plus turbine trailing time.
Switch-off of drive motor at 18 V.

9.4.4 Manual control

The individual aggregates for a function test can be specifically controlled via this menu. When exiting a sub-menu and when terminating the programme, all aggregates are reset to the starting position.



[1] The DOSE function is only available when the water valve is opened.

9.5 Overview of special functions and basic settings

9.5.1 Summary and basic setting of key menu

Program	Transport			Eco			Scrubbing & vacuuming		
	Key			Key			Key		
	yellow	grey	red	yellow	grey	red	yellow	grey	red
Operating hours		X	X		X	X		X	X
Speed	X	X	X		X	X		X	X
Key menu		X	X		X	X		X	X
Basic settings					X	X		X	X
Debug			X			X			X
Manual control		X	X						
System parameters		X	X		X	X		X	X
Battery menu		X	X		X	X		X	X
Water					X	X		X	X
Brush head		D	D						
Brush speed				Whisper			Power		
Contact pressure				20%			40%		
Suction				Medium			Power		
RM-Dosing				0,5%			1,0%		
Spray extraction									
Settings		X	X		X	X		X	X
Service reset			X			X			X
the language		EN	EN		EN	EN		EN	EN
Version		X	X		X	X		X	X

Program	Scrubbing & vacuuming			Scrubbing		
	Key			Key		
	yellow	grey	red	yellow	grey	red
Operating hours		X	X		X	X
Speed		X	X		X	X
Key menu		X	X		X	X
Basic settings		X	X		X	X
Debug			X			X
Manual control						
System parameters		X	X		X	X
Battery menu		X	X		X	X
Water		X	X		X	X
Brush head						
Brush speed	Power			Power		

Program	Scrubbing & vacuuming			Scrubbing		
Contact pressure	60%			80%		
Suction	Power					
RM-Dosing	3%			3%		
Spray extraction						
Settings		X	X		X	X
Service reset			X			X
the language		EN	EN		EN	EN
Version		X	X		X	X

Program	Vacuuming			Polishing		
	Key			Key		
	yellow	grey	red	yellow	grey	red
Operating hours		X	X		X	X
Speed		X	X		X	X
Key menu		X	X		X	X
Basic settings		X	X		X	X
Debug			X			X
Manual control						
System parameters		X	X		X	X
Battery menu		X	X		X	X
Water						
Brush head						
Brush speed				Power		
Contact pressure				100%		
Suction	Power					
RM-Dosing						
Spray extraction		Off	Off			
Settings		X	X		X	X
Service reset			X			X
the language		EN	EN		EN	EN
Version		X	X		X	X

9.5.2 System parameters

Parameter	Factory setting	Description
vRampInc	1	Acceleration ramp, larger numbers means faster acceleration.
vRampDec	20	Brake ramp, higher numbers means stronger braking
vRampIncss	2	Acceleration ramp, if sonar module is installed, larger numbers mean faster acceleration.
vRampDecss	20	Brake ramp, if sonar module is installed, higher numbers mean stronger braking
I_MB_MAX	80 A	Maximum permanent current of the brush drive
I_MT_MAX	30 A	Maximum permanent current of the suction turbine
LPotiSpeed	20	Speed pot, minimum value*
RPotiSpeed	70	Speed pot, maximum value*
LPotiWater	20	Water pot, minimum value*
RPotiWater	70	Water pot, maximum value*
NLZ Turbine	10 s	Trail time of the suction turbine, if you switch from a vacuum programme to a programme without vacuuming. Switch position OFF leads to an immediate stop of the entire machine. Here, the general contactor is separated. A trail is then no longer possible.
Brush delay	2 s	Trail time brush drive
Fact Fine	30 %	Brush speed, fine clean
Fact Whisper	60 %	Brush speed, whisper clean
Fact Power	100 %	Brush speed, power clean
Suction Low	70 %	Suction turbine speed, suction low
Suction High	100 %	Suction turbine speed, suction high
IRegBKminD	28 A	Minimum brush current, D-head
IRegBKmaxD	60 A	Maximum brush current, D-head
IRegBKminR	20 A	Minimum brush current, R-head
IRegBKmaxR	70 A	Maximum brush current, R-head
IRegBKminS	10 A	Minimum brush current, S-head
IRegBKmaxS	15 A	Maximum brush current, S-head
IRegBK-KP	50	Amplification factor of the current control of the brush drive. High value = strong change, low value = soft change

*__Changing the potentiometer stop positions__

Setting the minimum values:

➔ Move the rotary knob for driving speed / water volume into the left end position.

➔ Press the I button.

➔ Press the I button to confirm.

➔ The value is adopted.

Setting maximum values:

➔ Move the rotary knob for driving speed / water volume into the right end position.

➔ Press the I button.

➔ Press the I button to confirm.

➔ The value is adopted.

9.6 Debug Mode

Menu entry		Description	Information
S000 G000	S+G	in % depending on the drive switch actuation	Nominal and regulated value of the speed control. Set the rotary knob for drive speed to max. speed.
vs 0.0 vi 0.0	vs	Setpoint speed	
	vi	Actual speed	
H1: 0.0V 0.0A	H1	during forward drive	Drive motor voltage and drive motor current.
H2: 0.0V 0.0A	H2	during reverse drive	
T018 018 018 018	T	Temperatures to the MOSFET.	Normal = all values are approximately the same.
T 0.0A M 0.0A P000	T	Suction turbine motor current	Active current.
	M	permissible max. current	
	P	Speed in %	
B 0.0A M 0.0A P000	B	Brush motor current	
	M	permissible max. current	
	P	Speed in %	
IM 0A 1200/4500	IM	Motor current of drive motor Overcurrent timer 2 minutes / overcurrent timer 8 minutes	1200 equals 12 A 4500 equals 45 A The drive motor current must be between 12 and 45 A no longer than 2 minutes in an 8 minute period. Then, the current is reduced to 12 A.
QS 0.0V Qi 0.0V	QS	Motor nominal source voltage	24 V at max. drive speed setting on the potentiometer.
	Qi	Motor actual source voltage	Actual voltage to drive motor.
U_5V : 5.00V	U	Internal 5 V supply voltage	
Ubatt: 24.1V	Ubatt	Battery voltage	
AhCnt: 360000As		Current consumption counter [As]	Calculate battery capacity: AhCnt - AhMin / 3600 = momentary residual capacity
AhMin: 36000As		Non-removable capacity with drained battery pack [As]	
Ibatt: 000A		Active total current	The low voltage limit changes depending on the switched on consumer.
LowBatt: 22.0V		Low voltage limit with active loading current	
BK 0A Soll 0A Hub PWM 0% STP1			Brush motor current (contact pressure brush)
			Lifting motor pulse width modulation: 24V? 100%. The speed is proportional to the voltage.

Menu entry		Description	Information
S:00/36.0V/00.0A		Charge status / nominal charge voltage / nominal charge current	The debug mode must be switched off during the charging mode so that no interferences occur.
000 24.0V/00.0A		Charge timer / actual charge voltage / actual charge current	
Dali Err 000 ERR: CSXXX T0XXX		Number of faults during the charge process	Check the cable to the charger.
		Number of checksum faults	Information for developers.
		Number of timeout faults	
Exit		Back to main menu	

10 Technical specifications

		BR appliance			BD appliance		
		B 80			B 80		
		R 55	R 65	R 75	D 55	D 65	D 75
Power							
Nominal voltage	V	24					
Battery capacity	Ah (5h)	170, 180, 240					
Average power consumption	W	2200					
Drive motor output (rated output)	W	350					
Suction engine output	W	580					
Brush engine output	W	2 x 600					
Vacuuming							
Vacuum power, air volume (max.)	l/s	220					
Vacuuming power, negative pressure (max.)	mbar / kPa	167 / 16,7					
Cleaning brushes							
Brush speed	1/min	600 - 1300			180		
Dimensions and weights							
Theoretical surface cleaning performance	m²/h	3300	3900	4500	3300	3900	4500
Max. working range incline	%	2					
Fresh/dirt water reservoir volume	l	80/80					
Max. water temperature	°C	60					
Net weight (transport weight)	kg	280 (with 240 Ah batteries)					
Total weight (ready to operate)	kg	360 (with 240 Ah batteries)					
Values determined as per EN 60335-2-72							
Total oscillation value	m/s^2	0,1					
Uncertainty K	m/s^2	0,1					
Sound pressure level L_{pA}	dB(A)	69					
Uncertainty K_{pA}	dB(A)	2					
Sound power level L_{WA} + Uncertainty K_{WA}	dB(A)	83					
Power consumption							
Drive speed, forward	km/h	0,5 - 6					
Drive speed, reverse	km/h	0,5 - 4,5					
Brush motor, unloaded	A	7 - 13			10 - 16		
Brush motor	A	28,5 - 31,5					
Brush rollers at medium load on concrete plate							
Brush motor, overload after 10 to -20 seconds delay at:	A	75 - 85					
Suction turbine	A	20 - 26					
Vacuum bar lifted and tank lid closed							
Drive motor on even surface	A	12 - 16					
Max. current pick-up of drive motor	A	38					
Current pick-up of drive motor, lasts until	A	28					
Drive motor: Within 8 minutes, for a duration of 2 minutes:	A	28 - 38					
After that, limited to	A	28					
Charger	A	35					
Max. Load current during the charging of a depleted battery							
Charger							
Load current in the recharging phase at:							
maintenance-free batteries	A	0,5 - 1					
low-maintenance battery	A	4 - 5					
Lifting motor brush head	A	2,8 - 4,9					
Lift motor suction bar	A	1,0 - 3,0					
Detergent pump at max. flow volume	A	0,4					
Water quantity							
Water pump with max. water volume	l/min	>7,0					
Detergent pump, max. feed volume	l/min	>0,20					

Batteries

Kärcher part number	Nominal voltage	Nominal capacity	Battery type	Runtime (h) at power pickup (A)						Load cycles at medium load
				plain		medium		rough		
	[V]	[Ah]		[h]	[A]	[h]	[A]	[h]	[A]	
6.654-086.0	4 x 6	180	FT...WET wa	2,6	55	2	70	1,4	90	650 - 700
6.654-119.0	4 x 6	240	GIV wf	3,5	55	2,7	70	2,1	90	400 - 450
6.654-124.0	4 x 6	180	GIV wf	2,6	55	2	70	1,5	90	330 - 370
6.654-242.0	4 x 6	170	AGM wf	2,3	55	1,7	70	1,3	90	320 - 370

10.1 Exchange times

Part designation	Exchange time in minutes
Mains cable - charger	10
Operating field	20
Electronic performance part	25
Charger	15
Potentiometer drive lever	20
Suction turbine	20
Glide contacts of the suction turbine	20
Drive motor	40
Glide contacts drive motor	25
Detergent dosing pump	20
Pump hose of the detergent dosing pump	15
Flowmeter	10
Water valve	20
Float, wastewater reservoir, electrical	15
Float, wastewater reservoir, mechanical	1
Lint sieve, suction turbine	1
Brush head	10
Brush head intake	20
Brush head steering	15
Lifting motor brush head	25

Part designation	Exchange time in minutes
Lift motor suction bar	15
Swivel casters	20
Drive wheels	15
Dirt water drain hose	5
Suction hose	5
Parking brake	45
Vacuum bar holder	15
Battery fuse	10
Batteries	15
BD brush head	
Worm gear	45
Glide contact kit brush motor	60
Motor of brush drive	35
Ball bearing, brush drive	70
Disc brush	5
Brush head BR	
Motor of brush drive	30
Gear belt	10
Glide contact kit brush motor	60
Ball bearing, brush drive assembly	50
Brush roller	5
Wiping flap	10
Scraper roller of suction bar	5

10.2 Technical Documentation

Appliance type	Appliance no.	Circuit diagram	operating instructions	Spare parts list
B 80 W BP	2.259-001.0	0.089-434.0	5.964-361.0	5.971-446.0
B 80 W BP DOSE	2.259-002.0	0.089-434.0	5.964-361.0	5.971-446.0

10.3 Special tools

Intelligent Key, red	5.035-337.0
Voltage regulator	6.803-025.0
Multimeter	6.803-022.0
Torque wrench	6.815-090.0
Set service module	2.816-117.0
Molex puller tool	6.816-086.0
Hebe acid meter for low-maintenance batteries	6.803-015.0

10.4 Tightening torques

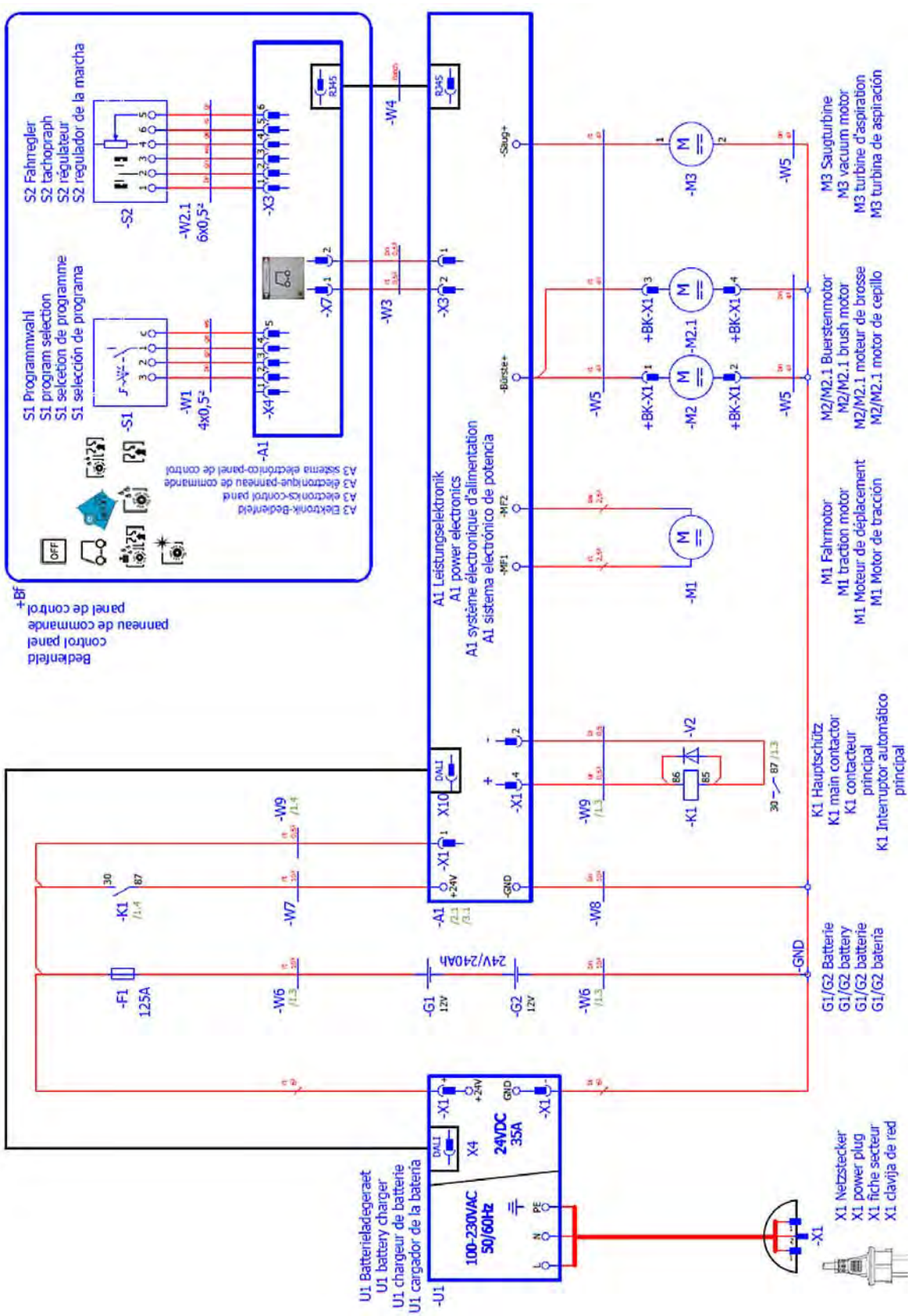
Locknut brush head pickup with the quick tensioning lever closed	6 Nm

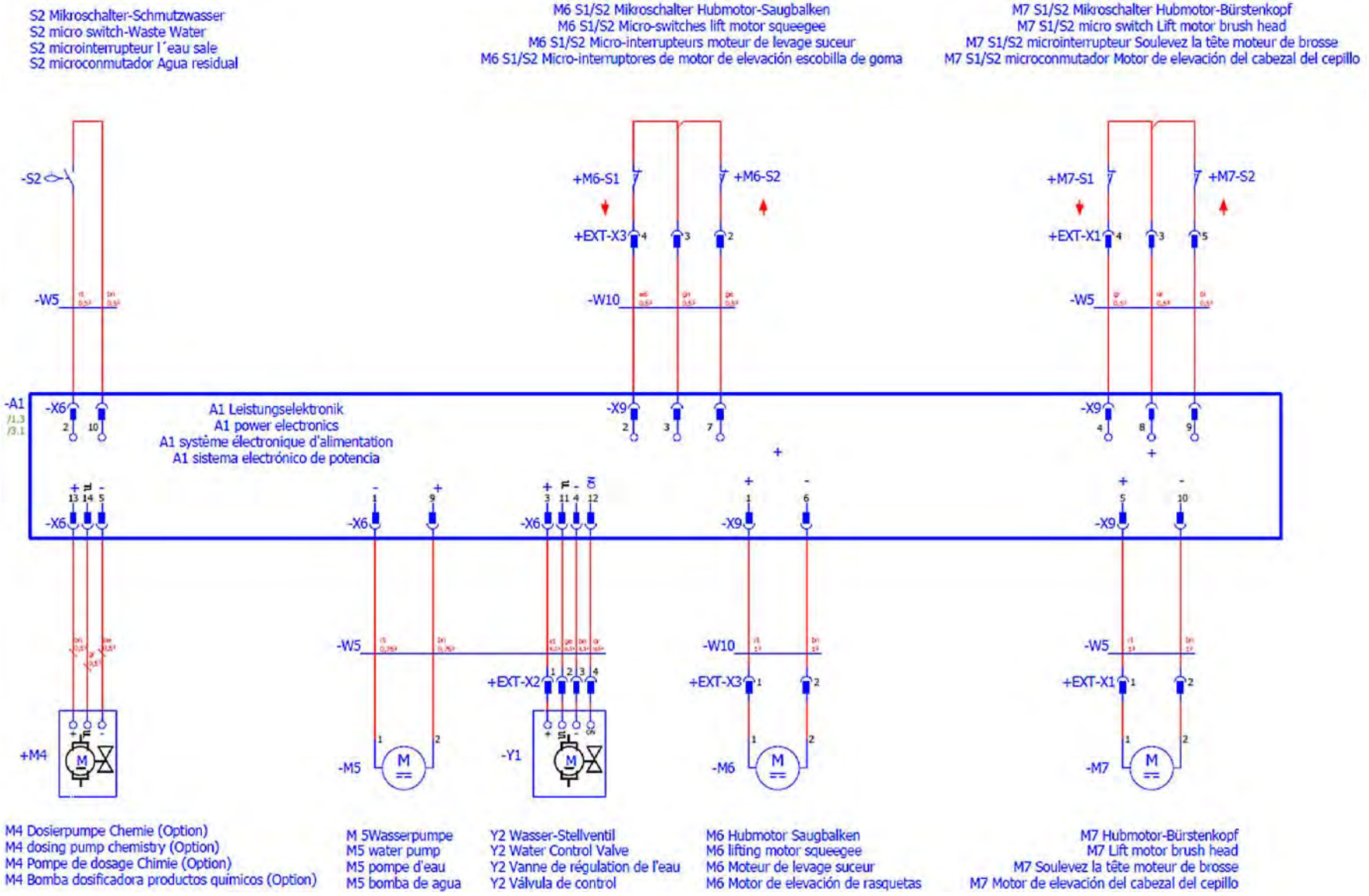
11 Circuit diagram

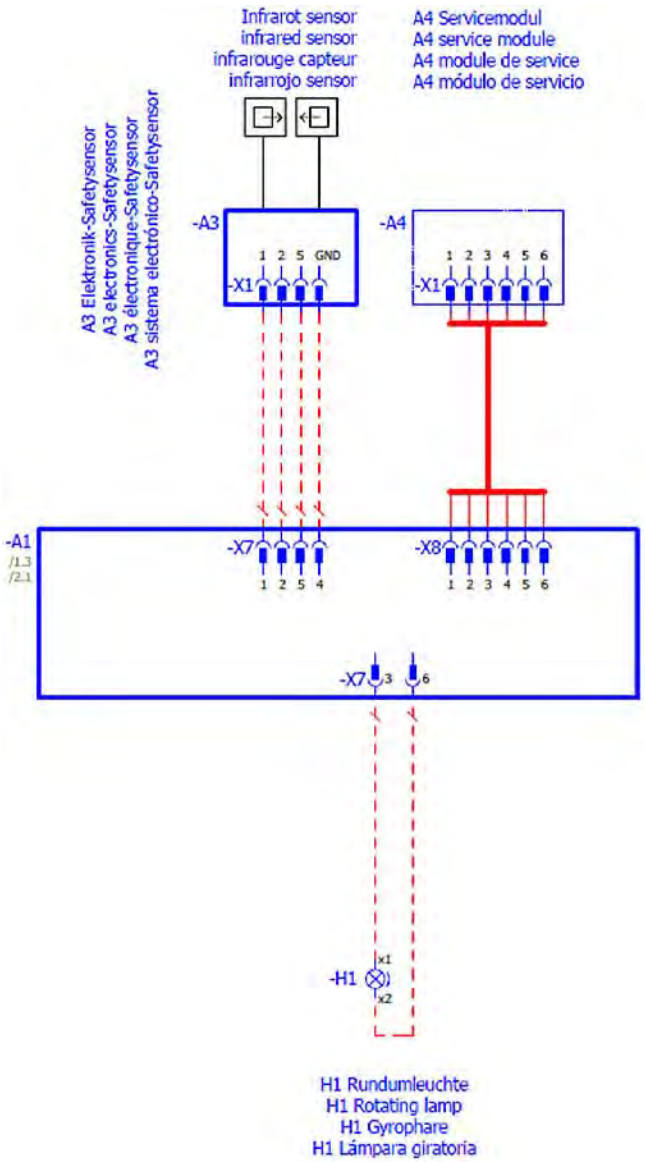
The current technical specification sheets and circuit diagrams will be included in the next version of the spare parts CD DISIS/DISIPlus and in the kaercher-inside (https://kaercher-inside.com).
Please always use the current circuit diagram.

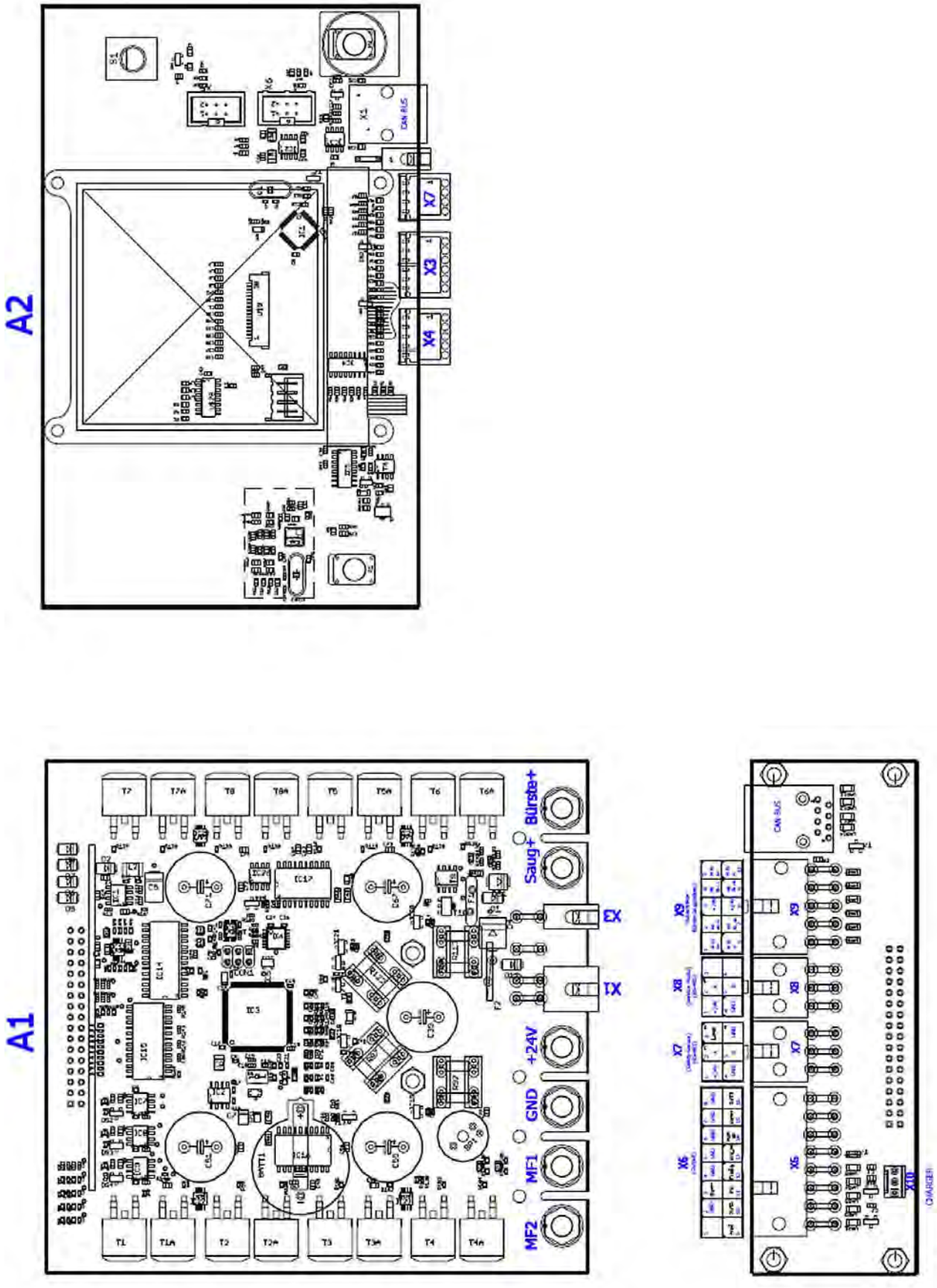
The circuit diagram in the service manual is not updated.

11.1 B80W 0.089-434.0




S2 Mikroschalter-Schmutzwasser
S2 micro switch-Waste Water
S2 microinterrupteur l´eau sale
S2 microconmutador Agua residual
M6 S1/S2 Mikroschalter Hubmotor-Saugbalken
M6 S1/S2 Micro-switches lift motor squeegee
M6 S1/S2 Micro-interrupteurs moteur de levage suceur
M6 S1/S2 Micro-interruptores de motor de elevación escobilla de goma
M7 S1/S2 Mikroschalter Hubmotor-Bürstenkopf
M7 S1/S2 micro switch Lift motor brush head
M7 S1/S2 microinterrupteur Soulevez la tête moteur de brosse
M7 S1/S2 microconmutador Motor de elevación del cabezal del cepillo
-S2
+M6-S1
+M6-S2
+M7-S1
+M7-S2
+EXT-X3
+EXT-X1
-W5
-W10
-A1
/1.3
/3.1
-X6
-X9
A1 Leistungselektronik
A1 power electronics
A1 système électronique d'alimentation
A1 sistema electrónico de potencia
+EXT-X2
-W5
-W10
+M4
-M5
-Y1
-M6
-M7
M4 Dosierpumpe Chemie (Option)
M4 dosing pump chemistry (Option)
M4 Pompe de dosage Chimie (Option)
M4 Bomba dosificadora productos químicos (Option)
M 5Wasserpumpe
M5 water pump
M5 pompe d'eau
M5 bomba de agua
Y2 Wasser-Stellventil
Y2 Water Control Valve
Y2 Vanne de régulation de l'eau
Y2 Válvula de control
M6 Hubmotor Saugbalken
M6 lifting motor squeegee
M6 Moteur de levage suceur
M6 Motor de elevación de rasquetas
M7 Hubmotor-Bürstenkopf
M7 Lift motor brush head
M7 Soulevez la tête moteur de brosse
M7 Motor de elevación del cabezal del cepillo


Infrarot sensor
infrared sensor
infrarouge capteur
infrarrojo sensor
A4 Servicemodul
A4 service module
A4 module de service
A4 módulo de servicio
A3 Elektronik-Safetysensor
A3 electronics-Safetysensor
A3 électronique-Safetysensor
A3 sistema electrónico-Safetysensor
-A3
-X1
1 2 5 GND
-A4
-X1
1 2 3 4 5 6
-A1
/1.3
/2.1
-X7
1 2 5 4
-X8
1 2 3 4 5 6
-X7 3 6
-H1
x1
x2
H1 Rundumleuchte
H1 Rotating lamp
H1 Gyrophare
H1 Lámpara giratoria
Option
option
option
Opción


A2
A1
X7
X3
X4
X2
X1
Saug+
Bürste+
+24V
GND
MF1
MF2
X9
X8
X7
X6
X5
X10

A1	Performance electronics
A3	Electronics safety sensor
A4	Service module
F1	Fuse 125A
G1	Battery, 12V
G2	Battery, 12V
H1	Beacon lamp (option)
K1	Main contactor
M1	Drive motor
M2	Brush motor
M3	Suction turbine
M4	Detergent dosing pump
M5	Water pump
M6	Lift motor suction bar
M6 S1/S2	Micro switch of lifting motor vacuum bar
M7	Lifting motor brush head
M7 S1/S2	Mikroschalter Hubmotor Bürstenkopf
M4	Dosing pump
S1	Program selection switch
S2	Drive regulator
U1	Battery charger
X1	Mains plug
Y1	Water valve